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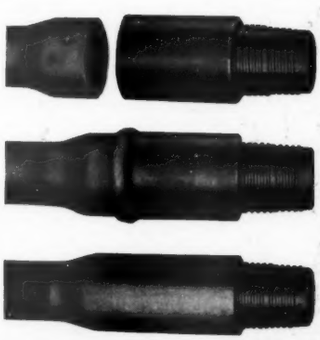

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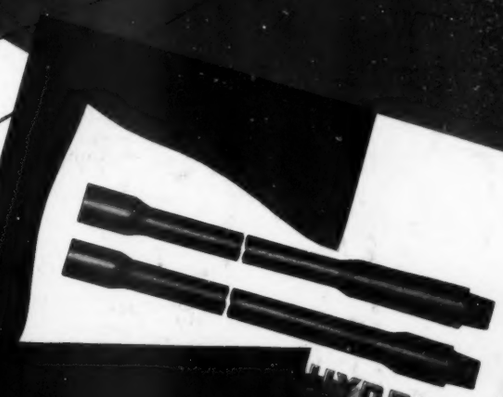

Bulletin No. 3141

HYDRIL
BULLETIN No. 3141

DRILL PIPE

HYDRIL

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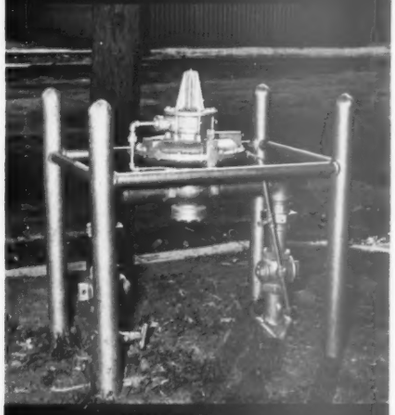
The EMCO "1001" REGULATOR

Two EMCO "1001" Regulators Controlling Pressure to Industrial Consumer



EMCO "1001" Regulator Controlling Pressure to Small Distribution Section

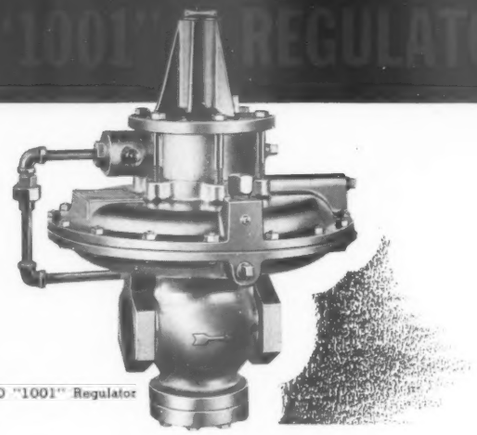


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Table of Contents

Vol. 39, No. 43 — March 6, 1941

News Developments

Trends: Liberal Allowables by Four Big States Signal for Caution 11
Segregation of Crude Oils Practiced More Generally ..... *H. Stanley Norman* 12
Sparks From the News 14
Unitized Repressuring Plan Is Proposed for Oklahoma City ..... *Robert Ingram* 15
North Texas Drilling Most Active in State ..... *D. H. Stormont* 16
Practical Application of New Louisiana Conservation Law ..... *Neil Williams* 17
Shell to Build Crude Line, Ventura to Wilmington ..... *L. P. Stockman* 19
News From the State Capitals 20
Editorial: Diminishing Returns 21
Cycling, Oil Control, Chief Topics at Shreveport A.P.I. Meet ..... *George Weber* 22
Export License Control Chief Weapon to Aid Democracies ..... *Henry D. Ralph* 23
North Texas Oil Men Told to Expect Higher Taxes 24
The Markets 24
Deaths 24
International News 26
Refinery Expansion 28
Natural Gasoline News 28
Natural Gas News 28
Recycling News 28
Programs and Meetings 31
Pipe-Line Activity 55

Engineering—Operating

Removal of Paraffin by Electrical Heating From Producing Wells in the Texas Panhandle ..... *Benton Turner and C. R. Rider* 34
Practical Economics of Cycling ..... *B. B. Boatright and P. C. Dixon* 41
Digests of A.P.I. Papers 45
Operating Ideas 50
Energy Requirements for Pumping Oil Wells ..... *S. B. Sargent, Jr.* 51
Progress in Metals ..... *W. L. Nelson* 53

Field Developments

Field Developments 57
N. Louisiana, Arkansas ..... *George Weber* 58
Kansas ..... *Robert Ingram* 60
Forest City Basin 60
Oklahoma ..... *Robert Ingram* 62
North Central Texas ..... *R. Marne Sanford* 63
Southwest Texas ..... *F. L. Singleton* 65
Permian Basin, Panhandle ..... *R. Marne Sanford* 66
Among Drilling Contractors 68
Indiana, Ohio, Kentucky 70
Rocky Mountain Area ..... *T. R. Ingram* 71
California ..... *L. P. Stockman* 72
Texas Gulf Coast ..... *Neil Williams* 75
Canada ..... *Victor Lauriston* 76
Illinois 77
Louisiana Gulf Coast ..... *F. L. Singleton* 79
Eastern Texas ..... *R. Marne Sanford* 80
Appalachian Fields 81
Michigan ..... *Otto C. Pressprich* 82
Mississippi ..... *George Weber* 83

Markets and Prices

Group 3 Market ..... *H. Stanley Norman* 86
New York Market ..... *J. P. O'Donnell* 87
A.P.I. Refinery Report 87
Tank-Wagon Market 88
Refinery Prices 89
Crude Prices 90-91

Additional Features

Personal Paragraphs 84
Record of Oil Securities 92
Equipment News 93
Classified Advertising 94-95
Advertisers' Index 96

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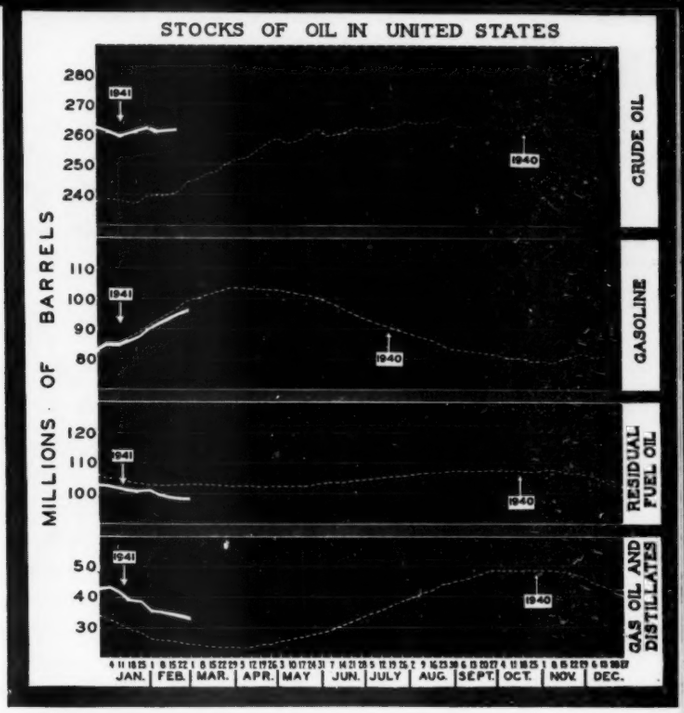
Trends

Liberal Allowables By Four Big States Signal for Caution



DANGER signals are flying on the course of the oil industry despite substantial improvements accruing to several phases of the business in recent weeks. State regulatory bodies are dealing more liberally with production schedules. At least four of the large producing states have edged above estimated demand in fixing March allowables. Experience shows that production usually expands more than expectations during any given proration period. By starting the allowables above the Bureau of Mines' estimate of required production the proration commissions are inviting an interruption of progress that is long overdue.

CRUDE PRODUCTION *3,623,435 bbl. daily average—down 4,230 bbl. One year ago 3,804,965 bbl.*

CRUDE STOCKS *261,783,000 bbl. as of February 22—up 835,000 bbl. One year ago 240,836,000 bbl.*

GASOLINE STOCKS *96,917,000 bbl. as of March 1 — up 1,105,000 bbl. One year ago 99,437,000 bbl.*

RESIDUAL FUEL-OIL STOCKS *98,647,000 bbl. as of March 1—up 16,000 bbl. One year ago 103,181,000 bbl.*

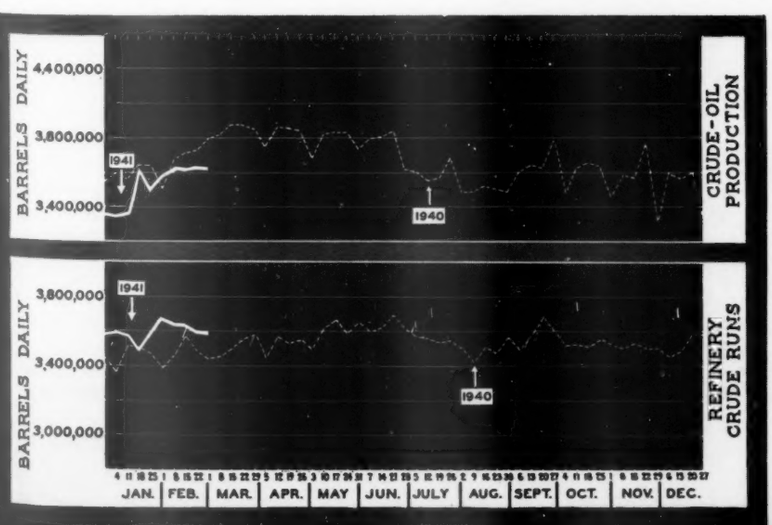
GAS OIL AND DISTILLATES *33,725,000 bbl. as of March 1—down 656,000 bbl. One year ago 24,590,000 bbl.*

REFINERY RUNS *3,585,000 bbl. daily week ended March 1—down 5,000 bbl. One year ago 3,445,000 bbl.*

Sustained improvement of the Gulf Coast gasoline market is acting as a spring tonic on the remainder of the motor-fuel supplies in the eastern part of the country. Stage advances of gasoline over the past 3 weeks aggregate 1 cent per gallon on coastal quotations. Other refining districts have not responded by correlative margins but the gasoline-market tone is definitely stronger in all sections east of the Rocky Mountains.

Buying which is now lifting the gasoline market results from a combination of conditions. Reduction of tanker rates to half of their December peak and indications that demand is exceeding even the more liberal estimates join in improving the motor-fuel outlook. Still, the favorable aspects are not entirely free of contingencies. Part of the supplies currently sought on the Gulf Coast represent business that was deferred until transportation costs subsided.

Furthermore, the defense program and its multiple ramifications present a set of circumstances that is not normal.



DAILY AVERAGE PRODUCTION FOR WEEK

	Mar. 1, 1941	Bur. Mines Mar. est. of demand	March state allowables	Feb. 22, 1941
Arkansas	69,820	69,700	69,969	69,740
California	587,250	596,400	571,500	605,250
Eastern fields	113,400	119,100	.....	112,200
Illinois	328,675	335,200	.....	320,400
Kansas	202,550	194,200	198,200	207,100
Louisiana	292,775	291,300	308,190	292,900
North Louisiana	*70,475*	.....	.....	*70,525*
Louisiana Gulf Coast	*222,300*	.....	.....	*222,375*
Michigan	40,215	47,700	.....	39,415
Mississippi	20,395	20,300	.....	21,005
Nebraska	3,350	3,200	.....	3,400
New Mexico	106,340	103,900	110,000	105,820
Oklahoma	409,725	437,400	400,000	406,700
Rocky Mountain states	103,940	109,700	.....	93,285
Texas	1,345,000	1,327,400	1,352,489	1,350,450
East Texas	*374,575*	.....	.....	*374,525*
West Texas	*236,125*	.....	.....	*235,425*
North Central Texas	*131,300*	.....	.....	*131,250*
East Central Texas	*73,175*	.....	.....	*72,575*
Texas Panhandle	*68,075*	.....	.....	*75,575*
Texas Gulf Coast	*369,150*	.....	.....	*368,850*
Southwest Texas	*92,600*	.....	.....	*92,250*
Total United States	3,623,435	3,655,500	.....	3,627,665
Total production January 1-March 1, 1941			187,965,895	
Same period last year			193,789,693	

The oil industry is no exception to conditions that prevail in other businesses. Varying percentages of purchases that have all the appearance of current business are in reality orders placed against rising prices. Higher costs may take the form of another bulge in tanker rates or the normal summer advance in gasoline prices plus whatever added margin is caused by defense.

Basic conditions continue to show the gradual improvement characteristic of recent weeks. Two large purchasers in Texas posted crude prices in fields in which they had been previously inactive. One of the postings, a flat 70 cents per barrel for Slaughter-Duggan field crude in Cochran and Hockley counties, Texas, was 7 cents below the regular West Texas gravity table for comparable weight oil. The apparent reduction is actually a devaluation because of the high salt content. The penalty focuses attention on trouble refiners are reporting with salt from many sections of the country.

Segregation of Crude Oils Practiced More Generally

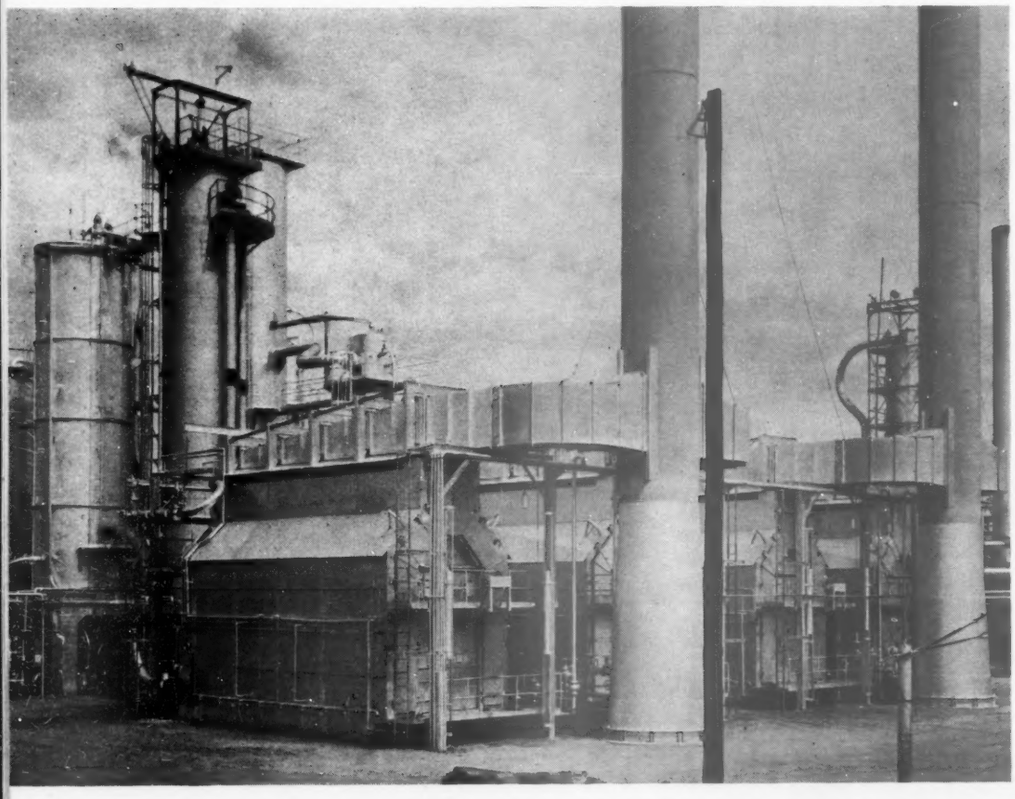
By H. STANLEY NORMAN

Some problems and the way they are met in segregating crudes to enhance refinery yields and lower processing costs are reviewed here. Pipe lines are limited in keeping crudes separated by physical factors. Meanwhile, refiners are extending flexibility of operations to deal with a constantly increasing variety of crudes since no two have exactly similar chemical composition.

INDUCEMENTS are growing more attractive for segregation of crude oils by types and grades so that their individual characteristics can be retained while in transmission to refineries. Improvement in refining technique and the constantly changing characteristics of consumptive demand are factors of strong influence. Refiners can do a better job if supplied crude oil that has a predominance of the byproduct most desired.

Physical limitations prevent segregation of crudes beyond certain points. But pipe lines are developing greater flexibility for the delivery of separate grades as the refinery demands become more exacting.

There are scores of factors contributing to the present practice of delivering increasing quantities of unmingled crude streams from fields to refineries of the industry. The more rigid specifications on numerous products dictate selection of crudes from which to extract the desired fraction. Although some crudes bear an extremely close resemblance to another or several others, no two samples from different fields are exactly alike. There are frequently noticeable dissimilarities in crudes from different parts of the same field. Oklahoma City crudes offer an example. Crude from the northern section has certain more desirable characteristics for the production of lubricating oil in some refineries than that from the southern part. The converse may be true under other methods of manufacture or in cases where the refinery requirements are slightly different.



This selective two-coil cracking unit commissioned recently at the Cosden Petroleum Corp. refinery in Big Spring, Tex., is symbolic of the facilities being added constantly by refiners to increase flexibility

The dissimilarity of crudes, ranging from slight to extreme, account for the creation of a changed set of conditions in the refinery each time oil from a different field is injected into the pipe-line stream. The opening of each new field may require a slight change in manufacturing procedure in order to obtain the maximum quantity and quality inherent in the crude's chemical composition.

The present degree of flexibility in refinery operation and the highly competitive market for products have increased the desirability of segregating crudes for the sake of maximum efficiency. The antithesis is also true in that refinery flexibility has equipped the manufacturing end of the industry to use a wider variety of crudes without sacrificing quality of products. Consequently, there is in reality a two-way stretch to the limitations of modern refineries.

In selecting crudes for maximum quality and quantity production of gasoline and lubricating oil, refiners look to the antiknock value in the first place and viscosity index in the other. Selected characteristics of representative crudes follow:

	Gasoline fraction to 400° F.		Lube-oil fraction (narrow cut)	
	Cut range volume per cent on crude	Octane No. (A.S.T.M.)	Cut range volume per cent on crude	Viscosity index (waxy)
Pennsylvania	0.3-39.5	46.9	78.7-85.3	106
Rodessa	0.5-36.5	35.7	83.2-86.2	109
Mid-Continent	1.2-28.6	44.2	70.8-77.8	100
East Texas	1.1-34.9	56.3	78.2-82.4	84
West Texas	0.7-31.3	52.8	68.2-75.6	60
Los Angeles Basin	0.2-23.9	59.3	59.2-61.2	...
Light Coastal	0.3-16.1	60.1	70.0-72.0	30
Heavy Coastal	0.1-11.0	63.7	65.3-67.8	21
Mirando	0.0-7.0	67.9	75.6-77.6	—145

Data derived from S. P. Coleman's chapter in "Elements of Petroleum," p. 18, an A.I.M.E. publication.

Increasing knowledge of crudes and appreciation of their individual characteristics for the manufacture of specific products presage a market significance that already has been asserted in local areas. The precedent of basing crude prices on gravity alone has been fairly well maintained, but refiners are growing more conscious of other qualities which may outweigh some of the former standards. The first tangible evidence that premiums for gravity alone are no longer justified came late last year when postings in certain Arkansas and Louisiana fields were adjusted. The gravity table in those local areas was rearranged, providing 1-cent differential for each higher degree of gravity rather than the previous spread of 2 cents.

Crude Values Change

In modern refinery practice it is possible that a low-gravity crude may have sufficient high-octane gasoline or a lubricant-distillate fraction of desirable viscosity index to make it more valuable to the manufacturer than a much higher-gravity oil. Some refiners foresee a rather radical change in evaluation of crudes in the not distant future.

General location and a sharp cleavage in fundamental characteristics have long dictated the general division of crudes into two general classifications—paraffinic and naphthenic or asphaltic. These liberal generalities are no longer sufficient for the close fractionation necessary to meet modern requirements for products.

In dealing with the problem of delivering certain crudes in their virgin composition to affiliated or customer refineries, the pipe-line companies have been ruled by circumstances. Lines which serve exclusively as plant facilities and as a link in a completely integrated company have

much greater latitude in delivery of uncontaminated types of crude. Delivery may be effected by "batching" or "slugging" through any line providing storage facilities, gathering systems, volume of tender, refinery storage and a multitude of other considerations permit this type of treatment. By looping and paralleling, several pipeline companies are now delivering as many as four different crudes from Texas to Chicago with practically no commingling of the grades.

The parallel-line method of segregating oils by types is being adopted in the northeastern part of the country by systems transporting products. Socony-Vacuum Oil Co., Inc., is laying dual arteries of 4-in. line from its main product system from Buffalo to Syracuse branching off to Rochester, Weedsport, Batavia and Geneva, N. Y. Construction of dual 4-in. lines to Rochester, Weedsport, Batavia and Geneva will permit delivery of two general classes of products. Gasoline, kerosene and other products down to No. 1 fuel oil may be delivered through one line. The other would serve for movement of No. 2 and heavier fuel oils thus avoiding color contamination of the light products.

Product Demands Change

The importance assigned to segregation of oils appears to be linked to some extent with the defense program. Demands for some petroleum products are advancing more rapidly than for others. Refiners are devoting increasing attention to ways of meeting the demand for special products. One of the byproducts for which demand has already increased substantially and may expand at a much faster rate is asphalt. Production of specification asphalts requires particular attention to the crude from which it is to be made and careful handling to guard against commingling with paraffinic-base oils.

Influence of the defense program on refinery operations and equally on crude-oil transportation was revealed at the last Texas state-wide proration hearing. Refiners displayed a particular interest in obtaining larger supplies of crudes high in lubricating-oil yield. The disclosure was made that demand for lubricating oils is advancing at a more rapid rate than for other petroleum products. New refining methods, particularly the solvent processes and closer fractionation, have extended the range of crudes from which satisfactory lubricating oils can be manufactured. The considerations given most importance now in selecting crudes from which to manufacture lubricants are the degree of naphthenicity and availability of the stocks. Segregation of the most desirable crudes for lubricating-oil manufacturing purposes perhaps involves more careful planning than the maintenance of separation in oils for making most other products. Extent of the problem arises from the widely scattered fields that produce crudes containing a desirable lubricating-distillate fraction. Here again, the individual facilities of the various companies, including controlled production, pipe-line systems, and process method are among the governing factors.

Crudes from the West Texas Permian basin are used by some companies for manufacturing their premium lubricating oils. Another company attempts to use Glennpool and Burbank crude exclusively in refining its top-quality motor oils. Still others favor Rodessa, South Texas, Gulf Coast and so on practically without limitation.

One company is now moving certain types of Mid-Continent crude to Philadelphia using a total of 12 different pipe lines to effect delivery of the original stock at the eastern destination without mingling along the route. This particular movement is handled by accumulating tenders of sufficient volume to justify uninterrupted transmission throughout the route from Oklahoma to Philadelphia and then it is "batched" through the systems participating in the hookup.

The batching method of pipe-line operation is not practiced extensively in the Mid-Continent. Crude from the Mid-Continent section is probably more generally uniform in composition than most other regions, although oils from the separate pools and subdivisions have individual characteristics. Furthermore, the Mid-Continent area, covering territory interlaced with small, scattered fields, in most instances presents an insurmountable economic barrier to extensive segregation of crude. A multiplicity of gathering facilities would be one of the first prerequisites to maintenance of individuality. Another impractical requirement would be uneconomic storage facilities which would be idle or only partially used while sufficient production was accumulated from the individual fields to qualify for tender.

Blends Often Delivered

In practice a refiner in Missouri, Illinois or Indiana may purchase crude in North Texas, tender it through one of the main pipe-line systems running north and actually receive delivery of Kansas crude. The pipe-line company, receiving crude from a multiplicity of gathering systems along its main system serving the Mid-Continent does not and cannot always deliver to refineries using its facilities the crude originally purchased by the manufacturer. By coordinating pumping operations as nearly as possible with delivery schedules refiners are given as much of the type of oil they desire as physically possible.

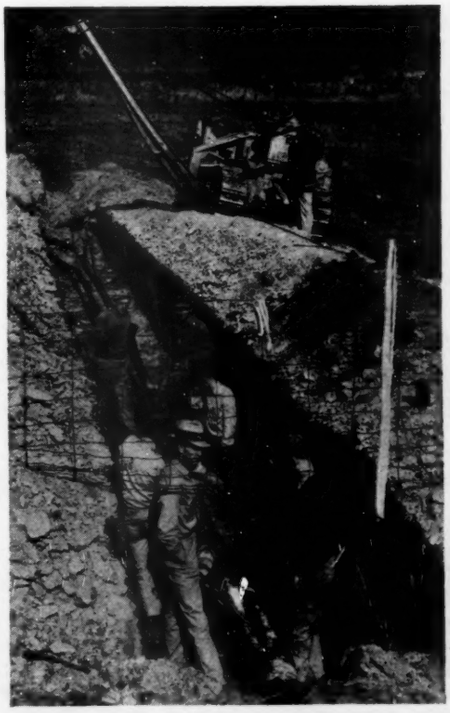
The close relationship of coastal producing fields and the large refineries on the Gulf Coast makes possible, by circumstance, a much sharper segregation of crudes. There are sharp and distinct differences in the various coastal and South Texas crudes, presenting, in the first place, a greater necessity for maintaining separate crude streams. Some of the large coastal refineries receiving up to 100,000 bbl. of crude daily keep separated as many as 12 to 15 types of crude from that many or more sources. This degree of separation is possible near the terminals of pipe lines because of the concentration of a variety of crudes in sufficient quantities to make batching operations practical and because the refineries' storage facilities furnish the necessary variety and reserve of tanks.

From a purely mechanical standpoint batching offers no particular problem in pipe-line operation. There is a slight intermingling of one batch with that immediately preceding it and that following. The mixture of batch ends is unavoidable unless separated by water or other substances. The extent of mixture is a function of pressure, volume and the diameter of the line. Intermingling is held to a minimum at capacity operation and under ideal conditions the separation is surprisingly sharp.

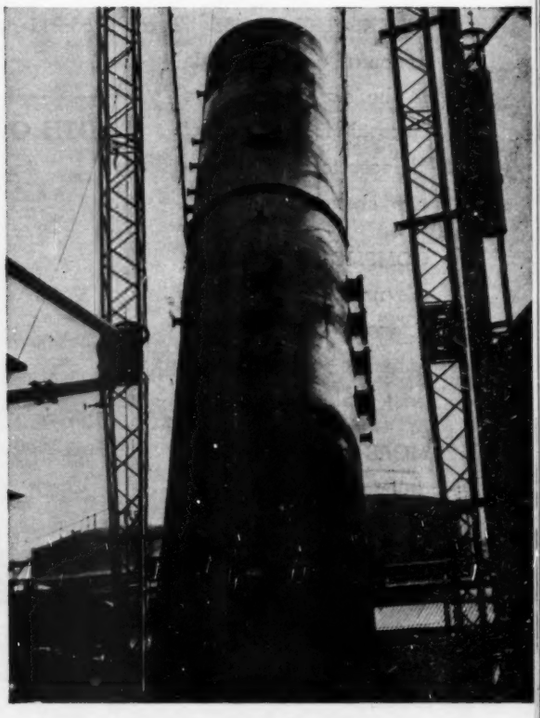
Diametrically opposed trends are presaged for refinery operations as the sources of crude supply and the types of oil increase by the number of new fields. In some refinery locations the wider the variety of crudes available the greater becomes selectivity in operation. The expanding sources and types of oil mean just the opposite to refiners in other locations. Plants dependent on a variety of producing fields for their crudes are compelled to install the processes that give the flexibility which elsewhere might be attained by selecting oils for processing. The requirements for refinery flexibility revolve chiefly around lubricating oils and gasoline. Refiners are in the position of meeting competition in quality by either selecting crudes which inherently yield the best and most of the specific product or attaining the same results from a mixture of raw material with superior fractionating and treating equipment. Economics are the determining factor.

Additional evidence of pipe-line operating flexibility is found in the expanding use of crude lines for the movement of natural gasoline where underground carriers for products are not available. Some crude lines have been used for transporting natural gasoline 10 years or longer but others are just now going into this phase of operation.

Dual lines in a single ditch designed to transport both heavy and light products from a refinery in the northeastern part of the country to consuming centers



Erecting an 11 by 76-ft. fractionating tower at Ashland Oil & Refining Co.'s plant at Ashland, Ky., one of the equipment pieces added to increase cracking capacity



SPARKS . . . FROM THE NEWS

WEAPON: Some of the provisions of the new export-license-control law are being bitterly contested by some exporters. But the State Department has not yielded from its firm stand.

PROSPECTS: Illinois is on the way to becoming the townlotter's paradise. In addition to the Mount Carmel development there are prospects for a hot campaign in and around the towns of Fairfield and Benton.

DOUBLE SEARCH: North Texas is currently the most active district in Texas, with search for shallow production continuing to account for much of the activity. However, deeper developments still account for the larger portion of interest.

STUBBORN STATE: The refusal of the Indiana Legislature to consider conservation legislation last week indicates one of the reasons why the federal Government can attract attention when it screams for national control.

APPLICATION: Louisiana's new conservation legislation requiring unitization of fields for drilling development is finding practical application in two coastal fields—Barataria and Golden Meadow. Success has attended both.

KILLING THE GOOSE: Texas is considering a 1-cent per gallon tax on all gasoline made in the state. There are colossal monuments of idleness to such legislative shortsightedness.

COMPLICATIONS: They are now comparing iso-octane to vitamins. Soon only the alphabet will limit varieties.

MORE FIRSTS: Deep drilling has opened up two more "firsts" — the first Trenton lime production for Pennsylvania and the first Smackover lime production for Louisiana.

NEW CHAPTER: Oklahoma City, already much in the news, is well on the way toward making another chapter in its singular and spectacular history. Now it is unitization and repressuring.

STANDARD FUEL: Students of our national defense say we need to establish a standard fuel of 80-octane number if we are to be ready to supply our new mechanized forces wherever they happen to be.

COMPROMISE: Unit operation has long been regarded as the most efficient method of development. Oil men want it on a voluntary basis. Government-control advocates want federal laws. Maybe state legislation will be a compromise.

SIDE BY SIDE: This month two affiliated companies are laying a gasoline and refined-products pipe line and crude-oil pipe line side by side, simultaneously, along the same route for a distance of 62 miles in the vicinity of Corpus Christi, Tex.

GEORGIA'S ROLE: With two large pipe-line projects depending on willingness to cooperate with the national-defense program, the Georgia Legislature in its deliberations this month regarding the removal of right-of-way obstacles is in the limelight.

THE SCORE: Wyoming is the only state that to date has definitely rejected invitation to join the interstate oil compact. In others the matter has been favorably acted upon or is still pending.

HUGE BY CONTRAST: A large airline uses 1,000 bbl. of aviation gasoline each day. That's enough to operate 4,100 heavy-duty trucks 1 hour.

SHIFT: California producers at the moment are more interested in heavy, nonrefinable crudes for booming industry than in motor-fuel supply for traveling America.

SOUTH OF THE BORDER . . .

The title "18 de Marzo" has been stamped on many Mexican petroleum facilities for nearly 3 years. The date is losing its patriotic significance as marking the end of private oil operations in 1938. A settlement may be near under which companies would return to again operate the properties which have accumulated a deficit of 70,000,000 to 150,000,000 pesos

Unitized Repressuring Plan Is Proposed for Oklahoma City

By ROBERT INGRAM

Operators at Oklahoma City, concerned by depletion of some districts, and intrigued by engineers' estimates that 100,000,000 bbl. of oil can be recovered by secondary methods, have drawn up a proposed bill for the state legislature to pave the way for a repressuring project.

OKLAHOMA CITY, Okla., Mar. 4.—Operators in the spectacular Oklahoma City oil pool made ready this week to tackle the problem of boosting production by secondary-recovery methods, and many of them were preparing for what they called "a new phase in the development" of the pool. After more than 2 years of engineering and legal research, the Secondary Recovery Committee, made up of 32 operators in the field, printed and distributed a 44-page proposed law which would empower the Corporation Commission of the State of Oklahoma to authorize the creation of secondary-recovery units in certain types of pools.

Restrictions in the proposed law as to the types of pools which might come under its provisions were so drawn as to include the Oklahoma City pool specifically and at the same time exclude nearly all other developed areas in the state. Common sources of supply to which the act would apply must be such that the average depth of the top of the producing formation is found at 6,000 ft. or more below the surface of the ground; a majority of the producing separately owned tracts embrace less than 20 acres each, and a major portion of the area of the common source of supply is within the limits of an incorporated city or town.

Thus, the Oklahoma City pool would be made the "guinea pig" for the formation and operation of secondary-recovery units in the state, and operators hoped thereby to silence much of the expected opposition to the legislation.

With the prolonged spade work behind them, proponents of the plan expect a long series of delays in getting approval by the legislature, testing in the courts and working out an acceptable plan of operation before they can start recovering the vast resources of oil which cannot be recovered economically by ordinary methods.

Complexity of the problems to be met and solved before the pool can be organized into a unit, or group of units, for the operation of gas-repressuring or water-flooding projects, is offset only by the estimates of oil recoverable by such methods. Official estimates of potential oil recoverable after primary methods have been exhausted are "conservatively" 100,000,000 bbl.

Higher estimates, although well founded, have been discarded by the Secondary Recovery Committee because "they sound fantastic to anyone not thoroughly familiar with the field."

Legal advisers for the committee, headed by Robert Williams, Oklahoma City attorney, have drawn and redrawn the proposed bill, with modifications suggested by various interests, in an attempt to gain as much preliminary support as possible before submitting it to the legislature. Originally the bill was drawn to authorize the creation of secondary-recovery units in any field in the state. However, since strong opposition was expected from operators in other areas who were not concerned about Oklahoma City, the bill was redrawn with its present restrictions.

Majority of Operators Favorable

There are still some major operators in the Oklahoma City pool who favor a bill covering all areas, but these are not expected to oppose passage of the present law since many of them favor it in principle. There has also developed some objection to the proposed act because of its provisions for veto power. As presented in printed form, 20 per cent or more "in interest among the lessees within the unit area" can block formation of the unit. Some think the veto power should be raised to 33 per cent, others say it should be lowered to 10 per cent. In spite of the care and study taken in preparation of the proposal, numerous objections have already been raised. In addition, a sizable group of interests, particularly the largest major companies, are greatly disturbed by the idea of accomplishing the unitization through legislation and would prefer a purely voluntary plan.

This general opposition to legislation contends that no matter how meritorious the present single instance may be, it none the less provides "an opening wedge" for more complete governmental regulation.

However, it is generally conceded that no voluntary secondary-recovery unit could be formed in the Oklahoma City pool because of the wide variety of interests represented. Mr. Williams pointed out that many of the royalty blocks are "split to thunder" with 500 to 600 royalty holders in a single block scattered from "Sweden and occupied France to Nome, Alaska."

Also, single-well operators on small tracts could hold up organization of the unit by placing outlandish values on their holdings, and over all lies the fact that producers in the north end of the field have operating conditions which differ widely from those in other sections and at present need not be concerned about their production.

After printed copies of the proposed bill have been distributed among the legislators and the oil operators and thoroughly studied by them, steps will be taken by the legal committee, Mr. Williams said, to have it introduced in the legislature. Whether that can be done before the legislature recesses for several days is still a question.

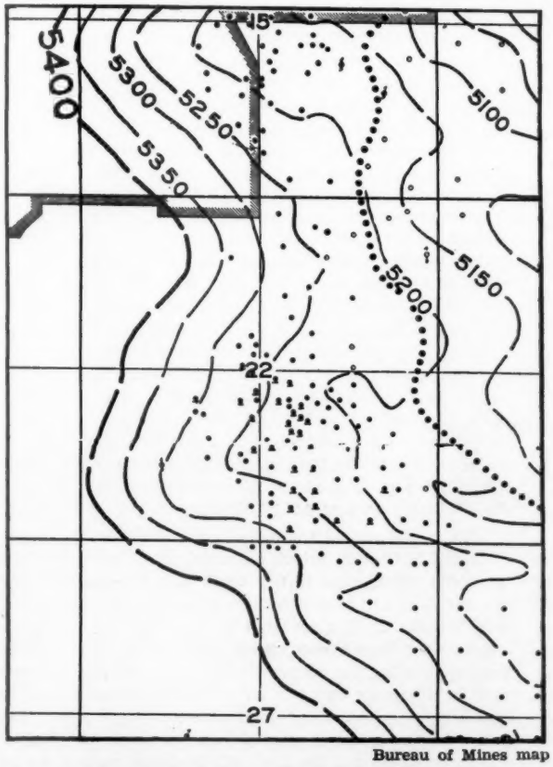
Meantime, a group of engineers, headed by Arthur D. Small, Oklahoma City consulting engineer, is going ahead with its research which has gradually taken shape. An exhaustive study of structure, sand conditions, production, water encroachment and other problems has been incorporated into a four-volume report which has been held in confidence by members of the Secondary Recovery Committee.

Mr. Small has headed the study since last summer when he replaced C. V. Sidwell, also of Oklahoma City.

At first, the engineers worked with the general plan of recommending a combined water-flood and gas-repressuring project.

Little information from other projects could be applied to the Oklahoma City field because of the conditions which have, to date, been encountered in no other pool.

Unusual was the general structure with the Wilcox sand thickness on the west side running to 220 ft. and gradually pinching out on the east, and also the peculiar porosity of the producing formations. Also to be considered were the higher formations producing in many parts of the field. Water encroachment was found to involve "an unknown quantity" between the sand and the oil and much doubt was expressed as to whether the usual water-flood practices could be applied. One of the major com-



Bureau of Mines map

The southern tip of Wilcox production at Oklahoma City has been picked as "guinea pig" for a secondary-recovery project

panies who pioneered in the research had in mind a water-injection project on the lower part of the Wilcox sand which would strip the oil from the sand grains and lift it into the wells. The history of water encroachment in the pool, however, indicated that water, instead of lifting the oil through the sand, had a tendency to wash channels through the sand and merely set up a continuous flow.

Mr. Small explained this action by the theory that the Oklahoma City Wilcox sand is "oil wet" and not "water wet." That is, he believes that the sand, when originally placed, did not contain water and that the oil therefore has a peculiar affinity for the sand particles which resists replacement by water. Therefore the fingering and channeling of water through the sands with no increase in oil production.

On the other hand, Mr. Small argued, the fact that the sand is "oil wet" explains why wells at the top of the Wilcox structure have lost production rapidly while wells deep in the lower part are still producing strong.

"The action," he says, "is similar to that of drying a shirt on the clothes line. The top of the shirt dries first and the water gradually goes to the shirt tail, which will remain wet long after the collar is ready to be ironed."

Gradually, this "gravity flow" theory of Wilcox production in the Oklahoma City field has gained in favor until now it is pretty well established. Backing it up is a complete study of production history in relation to depth, viscosity and pressure changes, and a study of cores in more recently drilled wells. In some of the wells cored in the higher, developed areas, the oil sand was found to have dropped to 20 per cent saturation. In sharp contrast was the established fact that around 35 per cent saturation is left by waterflood projects and about 40 per cent in gas-drive projects.

Another condition developed from a study of the oil level in older wells. It was found that this level was uniform in similar areas, but that as the pressure dropped from the original 2,630 lb., viscosity increased and the gravity flow became so slow that even though all but 20 per cent of the oil in place could eventually be recovered, it would take so long that it would be economically impossible.

Therefore, with the idea of keeping the pressure up to help drive the oil to lower parts of the sand where it was being drawn by gravity and at the same time to preserve low viscosity and permit a freer flow, a gas-injection project at low pressures of about 50 lb. will probably be recommended to drive the oil into deeper wells.

Thus, with the engineering and legal advice pretty well in shape, operators are ready to go into action to see what they can do.

The first area they hope to unitize is the southernmost closely drilled area in the field, which lies largely in Section 22. This will be the "guinea pig of the guinea pig." It was chosen because wells in that area are going off production rapidly and because the area is fairly well cut off from the rest of the field by a thinning of the sand where an old river was believed to have cut across the pool.

Of the 93 wells drilled in this district, only 30 are now producing. The aggregate production in this area has dropped steadily from 116,000 bbl. a month at the beginning of 1937 to 36,000 bbl. in January 1940. Average daily production for each well is now around 30 bbl., which means that many are operating at 15 bbl. or less daily and are already down to the point where they are maintained at a loss.

Operators of these depleted wells say they are holding on in the hope that secondary-recovery methods will give them another lease on life.

Twinned 3,800 and 4,300-ft. producers on a location in the Hull-Silk field

North Texas Drilling Most Active in State

By D. H. STORMONT

WICHITA FALLS, Tex., Mar. 4.—With development work centered mainly in the area's 1940 discoveries and in the K.M.A. and Hull-Silk fields, and wildcatting activity continuing at a rapid clip, North Texas is the most active district in Texas. A total of 32 new fields or producing horizons in old fields were added last year as the result of a widespread exploratory campaign. These new discoveries, plus the many undrilled proven locations in older fields, will keep activity at a high level thoughout this year. Though the total year's work in North Texas will probably be slightly less than in the outstanding year of 1940, the district during coming months is expected to remain the most active in Texas.

Wildcatting activity throughout the greater part of last year was centered around the Fort Worth basin play in Clay, Montague, Wise and Jack counties. This search netted 10 new fields or horizons in the lower Strawn and Bend series, but as the result of a series of failures in recent weeks exploratory work projected to the deep pays is tending to slacken. Wildcatting throughout the district, however, is as active as at any time last year. At the first of this month there were over 70 active tests projected to levels below 2,000 ft. and many more shallower tests under way.

Of current interest in North Texas are the favorable possibilities for widespread Ellenburger lime production in the southwest portion of the K.M.A. field. Ordovician production was first opened in the field in April 1940 at Fain-McGaha Oil Corp. 1-E Eph Griffin at 4,352-89 ft. Second test was drilled by Magnolia Petroleum Co. over 1 mile to the southeast, but was too low structurally and encountered water. Two other deep producers were added in the vicinity of the discovery later in 1940 and more recently two more were completed. One was the Phillips-Shell 20 Griffin, completed for a good producer ¾ mile northwest of the discovery well at 4,251-4,339 ft.

Most recent test of the Ellenburger is the Phillips-Shell 14 Preston, which extended possible production another mile to the northwest, although the test has not been officially gaged. Result of this activity is that an area about 3 miles in length, and possibly covering 1,000 acres, has been opened for the deeper lime production. (See p. 63 of this issue for map and further discussion of this activity.) Development of this new pay and of the field's regular Strawn pay in the northeast and west portions of the field will probably maintain activity in K.M.A. at 1940 levels throughout most of this year.

Presence of multiple-pay zones in many of the area's most important discoveries of the past 3 years has much to do with the present high rate of activity. The Hull-Silk field of Archer County, with 10 pays ranging from shallow Canyon sand production to 4,650-ft. lower Strawn, is the most outstanding example. In the Fargo field of Wilbarger County (discovered in the summer of last year and probably the area's most important new field) six prospective pay zones were encountered in fulfilling an Ellenburger depth contract at 6,717 ft., although for economic reasons the 3,250 and 3,900-ft. pays are receiving nearly all of the activity.

In Walnut Bend drilling is being prolonged by discovery of 4,100 and 4,700-ft. Strawn pays, where as earlier development was in its two deeper Strawn pays and in the deep Simpson and Ellenburger limes. The Bonita, Ringgold, Rogers & Rogers, Benton-Holmes, Consolidated and Henderson fields also have two or more pay zones which tend to make drilling more attractive.

Bonita Most Important

Of last year's deep discoveries resulting from the Fort Worth basin pay, the Bonita field of Montague County is proving to be probably the most important. With 21 producers completed in either of the field's 5,200-ft. Bend conglomerate pay or 5,400-ft. Bend Arkosic sand pay, some half-dozen rigs are currently active in the field. In the Ringgold field of western Montague, opened a year ago in the Bend series at 5,693-5,704 ft. with a second pay later being added at 5,789-94 ft., eight wells have been completed. No rigs are active at present, but work will probably be resumed shortly as the field offers possibilities of extension to the east. In the basin's two other deep Bend fields, the Hapgood field of eastern Clay County and the Hults-Owens field 12½ miles south of Ringgold, little work is being done.

In the Rogers & Rogers field on the west edge of Nocona, drilling has virtually defined production except on the west, but considerable acreage inside proven limits remains to be drilled. Just east of Nocona in the Benton field, which is thought to be on the same structure as Rogers & Rogers, only two rigs were drilling for the Bend pay at 5,100 ft. on the first of the month.

In the area between Hull-Silk and K.M.A., and in the Griffin pool of northwest Archer County, activity is increasing as the result of recent completions of good producers. In the Hull-Silk field

(Continued on Page 22)

Practical Application of New Louisiana Conservation Law

By NEIL WILLIAMS

BATON ROUGE, La., Mar. 4.—Provisions of Louisiana's new oil and gas-conservation law requiring unitization of fields for drilling development are finding practical application in at least two fields in the Gulf Coast district. These fields are Barataria, Jefferson Parish, and Golden Meadow, La Fourche Parish, in both of which prospective intensive and costly drilling plays in development of deep sands within townsite and small-tract subdivision areas have been forestalled. Along with Anse La Butte, St. Martin Parish, where active development of flank sands is under way, these are the first fields in which compulsory pooling of small interests has figured in unitization programs.

At Anse La Butte there have been few occasions so far for enforcement of the provisions for pooling of small tracts due to the close well-spacing program allowed in the field. Much of the acreage in the field is in small tracts but drilling units are of such size that generally they can be made to conform to these tracts. In one sand the unit is 7 acres, in another 5 acres, still another 3 acres, and in another only 2 acres. At Barataria and for the recently opened 10,300-ft. sand at Golden Meadow, recent proration orders have included compulsory pooling of small interests as a phase of unitization, and 20-acre spacing has been adopted. Within townsite and small-tract areas existing within these fields, numerous tracts and owners sometimes are embraced within a single established unit.

Under the new conservation law, the commissioner of conservation, "for the prevention of waste and to avoid the drilling of unnecessary wells," is required to "establish a drilling unit or units for each pool, except in those pools which, prior to the effective date of this act (Act 157 of 1940, Oil and Gas Conservation Law), have been developed to an extent and where conditions are such that it would be impractical or unreasonable to use a drilling unit at the present stage of development." The law interprets a drilling unit as being the "maximum area which may be efficiently and economically drained by one well."

In the establishment of a unit or units, the law provides that "when two or more separately owned tracts of land are embraced within a drilling unit which has been established by the commissioner (of conservation)—the owners thereof may validly agree to pool their interests and develop their lands as a drilling unit," and where owners do not agree to pool their interests, "the commissioner shall, if found by him to be necessary, for the prevention of waste or to avoid the drilling of unnecessary wells, require such owners to do so and to develop their lands as a drilling unit."

Pooling Made Compulsory

The special feature of the law is that the unitization and pooling of individual small interests is made compulsory. Under previous conservation laws, the right was granted to the Department of Conservation to authorize unitization and pooling when desired but it was not mandatory by law that the right be exercised, and unitized well-spacing and development programs carried out were largely voluntary on the part of the operators. It usually proved difficult to put into effect any unitization program involving pooling of small tracts.

At the same time the 20-acre unitization and pooling program was ordered for the 10,300-ft. sand at Golden Meadow, a 5-acre drilling-unit pattern was established for oil sands found between 5,000 and 6,000 ft. However, due to the fact that development in the latter sands already was considerably advanced and carried out without any definite spacing restrictions, and in view of the erratic sand conditions in those sands, no pooling of small interests was specified in the order. The small size of the units made pooling less necessary than in the case of 20-acre units.

Without compulsory pooling of small interests, the drilling and completion of additional wells on small tracts within a 5-acre unit can be authorized in the further development of the 5,000-6,000-ft. sands at Golden Meadow, but in those instances and in the case of multiple-well units already developed, allocation of allowable production is adjusted to conform with the individual well's prorata and equitable share in the total allowable allocated to the respective unit.

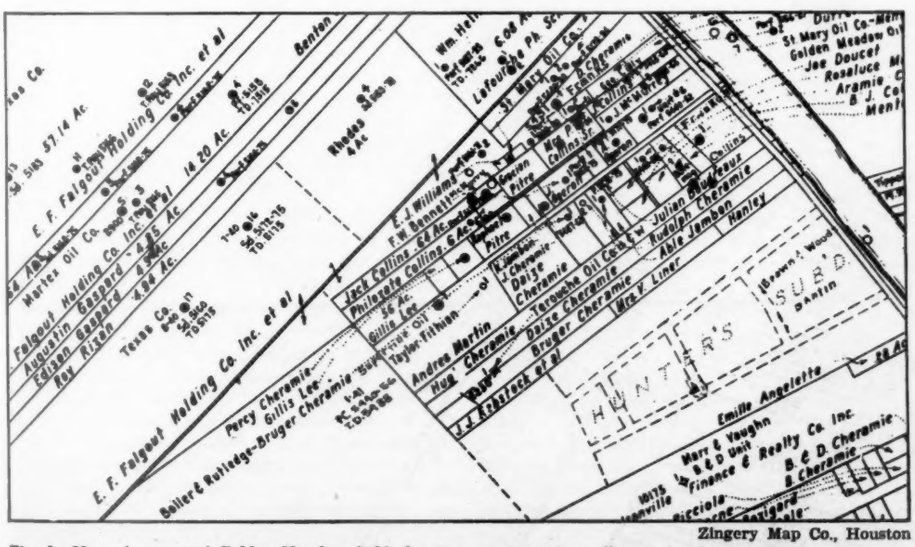
Producing sands at Golden Meadow other than those above designated are not involved in any specific unitization program at this time. Numerous sands have been opened in the field, some as shallow as 2,600 ft. with others as deep as 10,700 ft. Several of these sands either have been fairly well proved up or exploited already, or production in them has proved so spotted or isolated that unitization would not be practical or feasible. In other sands, wells completed so far have been located on large tracts sufficiently far from the townsite that there is no immediate threat of uncontrolled drilling exploration.

The Golden Meadow townsite, which is embraced in the Golden Meadow field, is typical of most coastal Louisiana bayou towns. It consists of numerous small lots, or elongated acreage fronting on and extending back lengthwise from Bayou La Fourche, on which the townsite is located. Many of the tracts, in addition to the numerous subdivided town lots, although they may contain several acres, are not more than 50 to 75 ft. wide. It was laid out in this fashion to provide all tracts with frontage on the bayou, the principal artery of traffic. The large unsubdivided block of the Texas Co., west of the townsite, lies entirely in the marshes.

Intensive Play

Within the Golden Meadow townsite, and along the boundary line of the Texas Co.'s block, one of coastal Louisiana's most intensive drilling plays has been carried on for the past 2 years. The field was opened late in 1938 with a deep-sand well on the Texas Co.'s block about a mile west of the townsite. Shortly afterward, production was extended to the edge of the townsite, where offset requirements forced rapid spread of drilling. Most of the development within and along the edges of the townsite has been confined so far to sands above 8,000 ft., chief of which have been the 2,600-ft., 5,150-5,200-ft., 5,300-ft., and 7,900-ft. sands, but in these sands numerous, closely spaced wells have been drilled.

Several attempts were made by a few operators early in the development of the field to obtain a more orderly well-spacing and development program for the field but these failed, and until now there have been no definite drilling restrictions except those imposed on the grounds of fire and other similar hazards. This unrestricted drilling has proved costly for operators as a whole. Except for wells immediately along the banks of Bayou La Fourche, where there is dry land, most of the development has been in the marshes,



Zingery Map Co., Houston

Fig. 1—Map of a part of Golden Meadow field showing unrestricted small-tract development in townsite area

where the necessity of building roadways and providing piling or mat foundations for wells and production equipment has added to the individual well costs. The hazards of blowouts due to presence of gas sands, and other difficulties forced special precautions in drilling and well control.

As the 10,300-ft. sand has indications of extending generally under the townsite, there were prospects of another intensive, competitive drilling play. In view of the greater depths involved costs and hazards are greatly increased in development of this sand. Such a competitive small-tract play, however, is being forestalled by the 20-acre unit drilling program established in the recent proration order.

So far only two wells have been completed in the 10,300-ft. sand, Texas Co. 3 La Terre Co., located about ½ mile southwest of the townsite, and Berkshire Oil Co. 1 Authement.

Prior to the completion of the second well in that sand, the new oil and gas-conservation law had been enacted, and further development in the sand has been delayed pending establishment of unitization and pooling of small interests. Indications point to this sand becoming the most prolific and consistent of any sand so far found at Golden Meadow.

Two sands, one at 8,200 ft. and the other at 8,700 ft., are involved in the unitization program at Barataria. A third sand, at 7,900 ft., is known to exist but so far no wells have been completed in it, and no drilling pattern has been established for it. Development, when undertaken, is expected to be on the same basis as in the two deeper sands, in both of which it is following a 20-acre unit pattern.

The drilling pattern for the 8,200-ft. sand, the discovery producing horizon of the field, is shown in an accompanying map. The pattern for the 8,700-ft. sand, although not conforming exactly to that of the 8,200-ft. sand, is similar in general layout. The units for each sand have been made as nearly uniform in shape as possible.

Ownership conditions at Barataria are similar to those at Golden Meadow. Along Bayou Barataria, which cuts through the field, acreage is subdivided into numerous elongated, narrow-strip tracts fronting on and extending back lengthwise from the bayou. These strips are of highly diversified ownership, conducive to the drilling of numerous unnecessary wells. Following opening of the field drilling permits were taken out on many tracts and in the bayou, but with unitization of the field most of these have not been drilled.

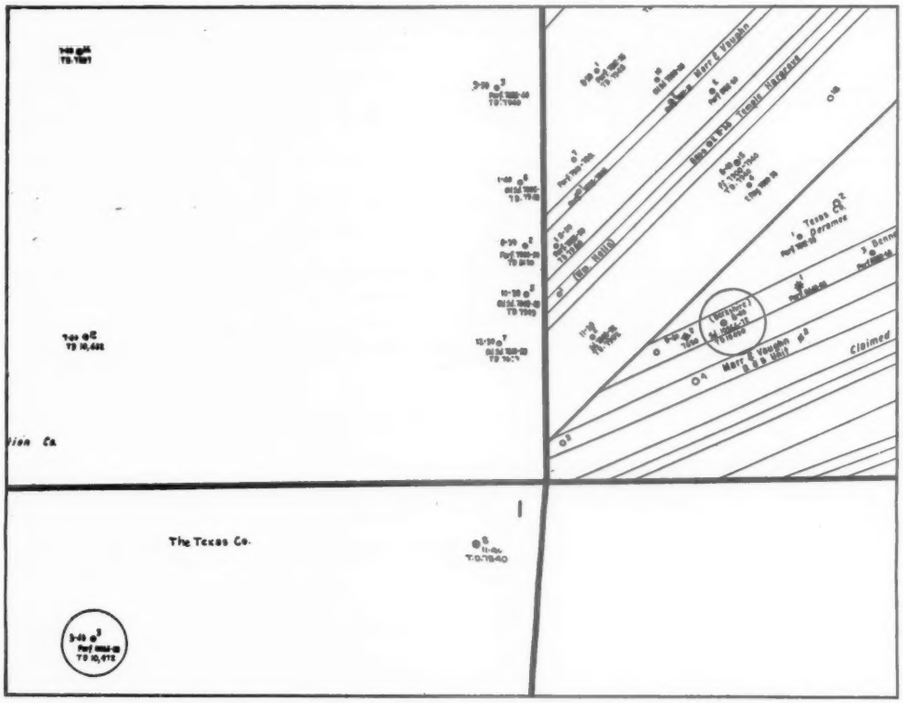
Eleven producing wells have been completed at Barataria. Of these eight are in the 8,200-ft. sand and three in the 8,700-ft. sand. Operating owners follow:

Operating company—	8,200-ft. sand wells	8,700-ft. sand wells
California Co.	5	2
Gulf Refining Co.	1	0
Carter, Perrin & Bryan	2	1
Total	8	3

The field was opened late in 1939. The discovery well, Standard of Texas 1 Adams-Rutley, located in what is now Unit A-3, was immediately offset to the south by Gulf Refining Co., located in what is now Unit A-2. Both of these wells are making water, and are probably extreme west-edge wells. A deep dry hole has been drilled just west of these wells by Standard of Texas.

Discovery well of the 8,700-ft. sand, Carter, Perrin & Bryan 2 Ruttley-Wiseman, is in what is now Unit B-1 on the southwest side of the field. Although this was the discovery well, the sand previously had been proved in another well drilled by Standard of Texas which tested the sand at a total depth of 8,797 ft., but because of offset requirements was forced to complete in the shallower sand.

Since, development has been extended gradually eastward and southward as successive units are drilled. The program calls for drilling the wells as nearly as possible in the center of their respective units, which in most instances are square. So far no indications have been given of any limits to the field in any direction except west.



Zingery Map Co., Houston

Fig 2 (Above)—Map of southwestern portion of Golden Meadow field showing contrast in development of small and large tracts. In circles are location of two wells in the new 10,300-ft. sand, development of which will be unitized on a 20-acre well-spacing pattern under Louisiana's new conservation law

Fig. 3 (Right)—Map of Barataria field, Jefferson Parish, Louisiana, showing units established for development of 8,200-ft. sand. Units for 8,700-ft. sands are similarly laid out although they do not conform exactly to those of the 8,200-ft. sand. Units for 8,200-ft. sand are designated "A" units; those for the 8,700-ft. sand "B" units

Zingery Map Co., Houston

Shell to Build Crude Line, Ventura to Wilmington

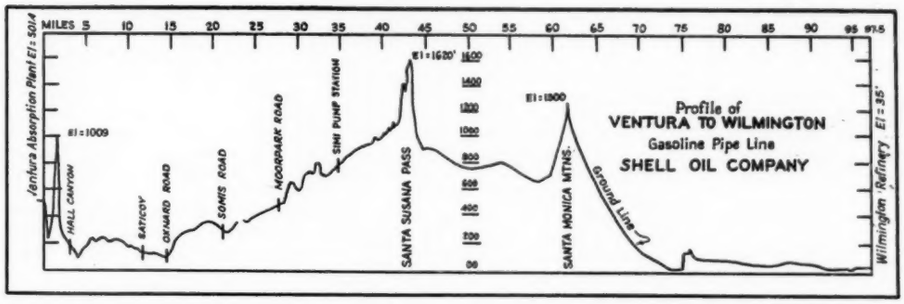
By L. P. STOCKMAN

LOS ANGELES, Calif., Mar. 4.—Shell Oil Co., Inc., has announced that it will let contracts within the next 30 days for the construction of a new crude-oil pipe line from the prolific Ventura Avenue field to its Wilmington and Watson refineries located adjacent to tidewater at Los Angeles Harbor. Maps, plans and specifications are nearing completion and bids will be asked within the next week or 10 days. This new pipe line, which will be 97 miles in length, will be 10 in. in diameter and electrically welded. It will parallel the company's present natural-gasoline pipe line for a greater part of the distance. Total cost of the new line will approximate $1,750,000 and tentative plans call for completion by July 1, 1941. The route to be followed permits rapid work as the highest elevation to be reached is 1,620 ft. in crossing Santa Susana Pass. A secondary elevation of 1,300 ft. is reached in crossing the Santa Monica Mountains to reach Los Angeles Basin. The line will pass through Hall Canyon, Saticoy, Somis, Moorpark and Simi on its rise to Santa Susana Pass. In order to reach Hall Canyon at the west end of the route, the line will rise 800 ft. almost perpendicularly. An elevation of 1,009 ft. will be ascended and descended in a distance of about 2 miles. This is the most precipitous part of the route.

The amount tentatively allocated for construction of this new crude-oil pipe line includes the cost of erecting all necessary pumping equipment and other auxiliary requirements including tanks, pump stations and manifolds. In addition to a pump station at the point of origin at Ventura Avenue, Shell contemplates the erection of additional pump stations at Simi and at a point between Santa Susana Pass and the Santa Monica Mountains. The Simi stations will pump the oil over Santa Susana Pass and the other station will move the oil over the Santa Monica Mountains. It will not be necessary to heat the crude oil from Ventura Avenue that will be moved through the new line as the gravity runs around 32° A.P.I. Shell's production in the Ventura Avenue field approximates 15,000 bbl. daily and thus the 10-in. diameter of the line is amply large to move an additional quantity of crude oil for either Tide Water Associated or General Petroleum Corp., both of which have production in this field.

First Pipe Line

Shell's projected line from Ventura to Los Angeles Harbor will, when finished, be the first crude-oil pipe line out of the Ventura Avenue field. Back in 1926 Shell constructed the first natural-gasoline pipe line out of the field and this line is still in use. It is the longest natural-gasoline pipe line in California and it is the only major installation that contains automatic pump stations. The natural-gasoline pipe line, which utilizes two different sizes of pipe in order to develop the proper hydraulic gradients at the elevations over which it passes, was finished in 33 days and it is logical to assume, therefore, that the new 10-in. crude-oil line will be laid and completed in about 2 months. Up to the end of 1940 the Ventura Avenue field has produced 225,948,588 bbl. of crude oil and current production is averaging around 33,750 bbl. daily. This entire amount of crude oil has been transported to refining centers by water transportation through the use of tankers. Tide Water Associated Oil Co., the major refinery of which is located in the San Francisco Bay area, will continue to move its Ventura Avenue production to Avon refinery by water. Pending completion of its new pipe line, Shell will continue to use tanker service between Ventura and refining centers.



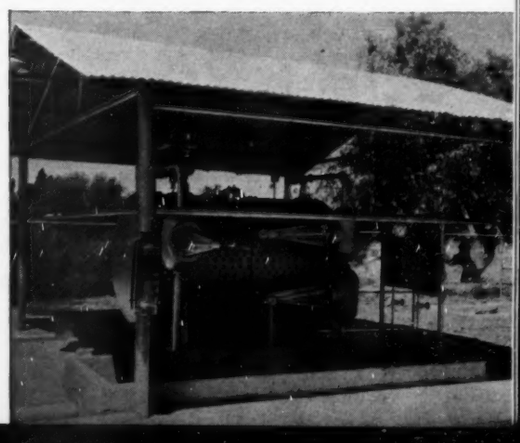
Profile of Shell's Ventura-to-Wilmington pipe line showing elevations reached and distances between various points

Shell Oil Co. has extensive holdings in the Ventura Avenue field and the decision to install a new crude-oil pipe line to Los Angeles Harbor is a normal expectation and development. This is particularly true in view of the fact that the Ventura Avenue field is expected to produce another 200,000,000 bbl. of crude oil, of which Shell can be expected to produce about one-half. In addition to this, construction of the new line will make the company more or less independent of water transportation and will guarantee regular movement from one point to another. Shell's Ventura-to-Wilmington line will be the first major pipe-line installation undertaken in California for several years as the last major line was the 72 miles of 10¾-in. pipe laid by the Valley Pipe Line Co. from Kettleman Hills to tidewater at Estero Bay in 1936. Also in 1936 Shell Oil Co. laid 304 miles of new pipe line from Bakersfield to Martinez in the San Francisco Bay region. This latter line was the longest pipe line laid in California in more than 25 years.

The natural-gasoline pipe line that Shell laid from Ventura to Wilmington was a radical departure at that time from ordinary practice and it was therefore necessary to pioneer pressure-loss mathematics in designing the line before undertaking actual construction. Williams & Hazan's formula was used in determining the pressure losses and the differential in specific gravity between water and gasoline was applied to the problem as a basis of arriving at the friction-pressure loss. Some of the same problems will be encountered in the construction of the new crude-oil line although considerable data are available at present. The pumps on the natural-gasoline line are multiplex eight-stage centrifugals specially built to deliver the required quantity at the required pressures, the line pumps being designed to handle 140,000 gal. per day at 600 lb. each. Two pumps are used, one at Ventura Avenue and an intermediate pump at Simi, although an additional standby pump was installed at each place. A steam turbine is used to drive the pump at Ventura and electrical energy is utilized at Simi.

Briefly, the Simi pump station on the natural-gasoline pipe line consists of a boiler-riveted steel pressure tank attached to which are four float cages. Two of these floats are set to operate a mercury switch which starts and stops the motor automatically, the other two floats being connected to ball-bearing throttle valves, one on the suction line and one on the discharge line. These valves and floats are so set that a constant governable quantity of liquid is kept moving through the automatic Simi pump station at all times. When the Ventura pump shuts down, the Simi pump automatically stops as the entire system is one of liquid-level control. This automatic control is also obviously of great value in the event of a line break as it minimizes the possibility of feeding gasoline of high volatility into a broken pipe line. Extreme care was used in the construction of this line in order to reduce leakage to a minimum and eliminate pipe-line breaks as far as possible. The line was tested hydraulically to 1,000-lb. pressure after being placed on the trench and, with all leaks made absolutely tight, full protection is assured against line breaks and operating difficulties. It was well insulated and buried from 2 to 4 ft. It has operated without trouble ever since construction with the exception of pump overhauls at periodic intervals.

Automatic control station of Shell's natural-gasoline line at Simi, Calif., showing construction of metal shelter and float cages governing throttle valves on suction and discharge lines



STATE CAPITALS...

TEXAS

MARCH ALLOWABLE will average 1,352,489 bbl. daily, according to the new proration order issued by the Railroad Commission which becomes effective March 10. Basic allowables for the state total 1,811,678 bbl. but the net average is reduced by the provision for 5 shutdown days in the Panhandle; 9 in East Texas and 10 for other fields in the state.

Normal underproduction of 3.5 per cent combined with the net reduction caused by shutdown days brings the actual allowable, Railroad Commission engineers say, 22,248 bbl. below the Bureau of Mines' estimate of 1,327,400 bbl. for March demand in Texas.

Comparative basic allowables by districts for December 1, January 25 and March 10 are:

	Dec. 1	Jan. 25	Mar. 10
Southwest Texas	295,303	295,816	305,803
Gulf Coast	307,252	316,662	317,390
East Central Texas	90,868	83,133	85,455
East Texas	520,851	520,851	520,851
West Central Texas	58,454	59,315	57,119
West Texas	268,864	289,538	299,031
North Texas	130,638	140,681	139,798
Panhandle	82,496	86,424	86,586

The commission reported last week that Texas crude stocks on January 31 totaled 84,424,769 bbl. compared to 85,377,237 bbl. a month earlier. Crude imported at Texas terminals totaled 9,454,684 bbl. in January compared to 9,829,639 bbl. in December.

HEARINGS ON A BILL to create a new oil and gas commission were started Monday and continued Wednesday before a house committee headed by Rep. Augustine Celaya of Brownsville, Tex. Proponents of the measure were heard during the first day of hearings before the state affairs committee. Arguments were advanced that the oil industry in Texas has grown to such proportions that it requires a separate administrative body to direct conservation. A new board, proponents argued, would relieve the Railroad Commission of excessive duties and permit Messrs. Thompson, Culberson, and Sadler to devote undivided attention to regulation of rail and truck carriers.

INFORMATION ON EACH producing oil well in Texas is to be sought by the Railroad Commission to avoid frauds in the allowable schedules if Ernest O. Thompson, chairman, concurs with Commissioners Sadler and Culberson. An order has been prepared requiring sworn reports on the status of each of the state's 95,558 oil wells. There will be no exceptions, the commissioners have declared.

The "teeth" in the order are requirements that the reports be sent to the commission through the United States mail, accompanied by an affidavit that the statements are known personally to the affiant to be correct and that they are made for the purpose of obtaining permission to produce oil. Success of the proposed order would eliminate some of the friction between producers in various sections of the state. Charges have been made that many "dead" wells are assigned allowables and that in fact the production is taken from other wells in excess of their individual quotas.

STRONG OPPOSITION to the tax bill now pending action in the Texas Legislature that would impose a levy of 1 cent per gallon on all gasoline produced in the state was launched at committee hearings in Austin, Tex., last week. Civic, industrial, and labor organizations from all parts of the state, but particularly from the Gulf Coast, made a determined effort to show that enactment of the bill would drive the refining industry into neighboring states and work to the detriment of Texas. The bill is represented as a means of raising from $80,000,000 to $87,000,000 annually.

Opponents testified that enactment of the bill would drive refining operations to Louisiana and other states where the processing could be done just as well. The assertion was made that enactment of the bill would place Texas refiners under an impossible financial burden and would permanently kill their competitive position. It was shown, for example, that a tanker of gasoline produced in Texas would carry a tax burden of $42,000 over the regular cargo price of motor fuel. This, it was contended, would drive jobbers and large distributors in the East to other parts of the country.

MINIMUM-PRODUCTION schedules based on depths of Texas wells would be made mandatory if a bill introduced last week is enacted. Representative Bray of Longview, Tex., is the sponsor.

The bill provides that no well 2,000 ft. deep or less shall be restricted under 10 bbl. daily; between 2,000 and 4,000 ft. deep, not under 20 bbl.; between 4,000 and 6,000 ft. deep, not under 25 bbl.; between 6,000 and 8,000 ft. deep, not under 30 bbl.; in excess of 8,000 ft. deep not under 35 bbl.

The house oil and gas committee has not yet set for hearing various measures for prorating condensate and distillate as produced by recycling plants. Chairman Clark, Breckenridge, Wednesday gave assurances that the bills will be heard, but that there is plenty of time. Not until April 1 can the bill for making the oil and gas laws permanent come before the house for action, the house having passed a motion specifying this date.

Representative Bray said his bill, if passed, would raise production in the East Texas field from 50,000 to 75,000 bbl. a day.

AFFIRMATIVE VOTE of 119-6 has been given by the house to a bill allowing use of sweet gas for the manufacture of carbon black at a Gray County plant in the Texas Panhandle. Representative Favors, sponsor of the bill, explained that the Gray County plant was the only one in the state that would be affected. He said that conditions constituted a twilight case where several one-time sour-gas wells had been reclassified in December by the Railroad Commission as sweet-gas producers.

Meanwhile a carbon-black bill of wide interest in the Panhandle remained in subcommittees in both house and senate. This proposal would allow sweet gas, wherever produced, to be used in carbon-black manufacture provided the gas has no market for use as light or fuel.

A CONCURRENT RESOLUTION has been passed by the senate and house petitioning Congress not to authorize federal control of the oil industry. The resolution declared that Texas, through cooperation of the industry and existing regulatory agencies, could efficiently meet any emergency in which the industry was involved.

KANSAS

PARTICIPATION OF THE STATE for another 2 years in the interstate oil compact has been assured by Governor Ratner's approval of the bill previously passed by the legislature.

THE CORPORATION COMMISSION has fixed March allowable at 198,200 bbl. daily, an increase of 2,000 bbl. daily over February. The commission set the base allowable at 194,200 bbl. daily, the figure recommended by the Bureau of Mines, and added 4,000 bbl. a day for new wells completed during the month.

PURCHASERS' NOMINATIONS for crude oil in March totaled 197,856 bbl. daily, according to compilations made by the Corporation Commission following a hearing last week at Wichita, Kans. The nominations aggregate 3,656 bbl. daily more than the Bureau of Mines' estimate for March demand in Kansas. March nominations were higher than the bureau's estimated demand for the first time in more than a year.

Crude-oil nominations for the month of March in Kansas follow:

	Barrels daily
Atlantic (shallow water)	1,660
Barnsdall	920
Bay	1,700
Champlin*	200
Cities Service	17,500
Continental	20,000
Co-op. P. L. Assn.	2,666
Derby	6,500
El Dorado*	715
Falcon	895
Globe	2,500
H. & T. Reclaim	500
Kanotex	3,300
National	2,300
Petroleum Products	1,650
Phillips	15,000
Shell	10,500
Sinclair Prairie	15,500
Skelly	18,000
Standard	35,000
Texas	8,500
Vickers	2,250
White Eagle Purc.	27,000
Other miscellaneous*	2,800
Total	197,500

*Estimated.

RECORD HIGH POTENTIAL oil production of 7,300,495 bbl. daily was reached by Kansas on February 20, an increase of 58,643 bbl. over January. The Conservation Commission figure is based on the rated capacity of 20,840 wells. There are 66,226 prorated wells with a potential of 7,248,748 bbl. daily and 14,614 unprorated wells producing 51,747 bbl. daily.

ARKANSAS

GOVERNOR ADKINS has signed the interstate oil compact making Arkansas the eighth state to join. Other members of the compact are Texas, New Mexico, Oklahoma, Kansas, Colorado, Illinois, and Michigan. Louisiana's Legislature has passed a bill authorizing that state to join but the federation papers have not been signed.

Signature of Governor Adkins was affixed to the compact February 27. The instrument was taken to Little Rock by W. J. Holloway, Compact Commission attorney, and Charles L. Orr, secretary.

NEW MEXICO

ALLOWABLE PRODUCTION in March has been set at 110,000 bbl. daily, an increase of 4,000 bbl. over the February figure. The allowable set by the New Mexico Oil Conservation Commission is about 7,000 bbl. daily higher than the Bureau of Mines' recommendation. H. R. Rodgers, commissioner, said that the higher allowable was because the state's oil industry is beginning to feel the effect of the national-defense program.

CALIFORNIA

THE INTERSTATE OIL COMPACT battle in California is getting hotter from week to week. This week the California Oil and Gas Association endorsed the bill that would make California a member. The Independent Petroleum and Consumers Association, headed by J. A. Smith, came out against the proposal and sent a copy of its position to all members of the legislature. A bill was introduced several weeks ago providing for an enabling act and specifying that the director of natural resources would be the state's representative.

Directors of the California Oil and Gas Association polled the membership. The vote was 87 per cent affirmative. Previously the Oil Producers Agency of California, headed by L. L. Aubert, had endorsed the compact.

The OIL AND GAS JOURNAL

PRODUCING REFINING NATURAL GASOLINE PIPE LINE

Published weekly by The Petroleum Publishing Company at Tulsa, Oklahoma

Diminishing Returns

A bill has been introduced in the Texas Legislature in which it is proposed to levy a 1-cent tax against each gallon of gasoline made in the state. Sponsors of this processing-tax bill contend that 80 to 87 million dollars annually can be raised by this scheme. They show that 85 per cent of Texas-made gasoline moves beyond its borders for consumption. It is naively argued that benefactors from Texas resources would thus pay a reasonable tax for minerals originating in the state.

The probabilities are that this almost unbearable class tax will never get into the statute books. Surely it won't if the lawmakers pause for a bit of sober reflection.

The money that would be raised by this latest attempt to tax the petroleum industry would go to pay social commitments of Texas. It is to be wondered if the legislative sponsors are overlooking the social function already performed by the Texas refineries. There are 40,000 Texans employed by the refineries in that state, and the annual payroll totals 50 million dollars. This contribution to spending power is in excess of that of any other industry.

Texas, of all states, can ill afford the risk of driving petroleum refining from its borders. Nearly a sixth of the nation's refineries are in Texas. They have 30 per cent of the reported active capacity of the country. This concentration of plants and capacity carries a connotation of permanency. So also did the textile mills in New England, the coal and silk manufacturing industries in Pennsylvania. But unfriendly tax assessors made relocation of factories economically desirable. The same inducements could apply to relocation of Texas' refineries. There was a time when it was almost imperative to build refineries on tidewater, to take advantage of low-cost water transportation to consuming centers. But with the constant expansion of pipe-line systems, this necessity is subdued. Refiners still prefer the coastline but not at too high a price.

The oil industry already pays 55 per cent of all Texas' tax revenues in one form or another. A burden beyond this point is dangerous. There is a law in economics known as the law of diminishing returns. There is no appeal from this law. It is inexorable. Records are studded with sad failures of tax-raising panaceas which have ignored this law.

It is conceivable that this new proposed tax would endanger the security of 40,000 refinery employes. It would also make vulnerable the security of the industry's additional 135,000 workers. It would jeopardize the general economy of Texas. It is dangerous for political subdivisions which now derive benefit from the property values created by oil refineries and their personnel.

The argument that a uniform tax on all branches of the industry is more desirable than singling out one class is sound. The petroleum industry as a unit has never objected seriously to just and reasonable taxation in Texas or elsewhere. In opposing a tax that would add $42,000 to the cost of a tanker of gasoline leaving Texas the industry is not deviating from its record. The 85 per cent of Texas-produced gasoline shipped to other states for consumption competes with all other sources of supply. It cannot stand a handicap of 1 cent per gallon in the highly competitive market.

But even if this current tax effort is defeated, it points out the need for constant vigilance, and it is a situation that might develop in any of the other oil-producing states. It is indicative of how some solons regard big business—not as assets to the economic welfare of the state in providing jobs, but as fair game for the tax collector to go gunning for every time politicians decide to increase expenditures.

Cycling, Oil Control, Topics At Shreveport A. P. I. Meet

By GEORGE WEBER

SHREVEPORT, La., Mar. 4.—Gas cycling, economics, control and drilling, and production problems occupied the attention of oil men here for the annual spring meeting of the Southwestern district, American Petroleum Institute. A total of 560 A.P.I. members registered for the 2-day session, February 27 and 28.

At a business meeting, E. P. Hayes, Texas Co., Houston, Tex., was elected chairman of the district for the 1941-42 term of office. He succeeds L. A. Ogden, of Pure Oil Co., Fort Worth, Tex. Vice chairmen, elected to represent the seven producing areas of the Southwest district, are: E. B. Miller, Jr., Tide Water Associated Oil Co., Kilgore, for East Texas; Maston Nixon, Southern Minerals Corp., Corpus Christi, for Southwest Texas; John D. Trimble, Bailey & Trimble, El Dorado, for Arkansas and North Louisiana; S. E. Buckley, Humble Oil & Refining Co., Houston, for Texas Gulf Coast; D. A. Jordan, Atlantic Refining Co., Odessa, Tex., for New Mexico; W. H. Collins, Shell Oil Co., Inc., Wichita Falls, for North and West Texas, and J. H. Rambin, Texas Co., New Orleans, for South Louisiana. R. H. McLemore, Sun Oil Co., Dallas, Tex., was elected secretary-treasurer.

Cycling Discussed

One of the four sessions was devoted to a study of cycling. In presenting "Practical Economics of Cycling," B. B. Boatright and P. C. Dixon, of Houston, gave a comprehensive outline of investigation and procedure in evaluating gas-condensate fields with the object of cycling. In introducing the subject, the authors voiced the opinion that 1941 may see a doubling of the volume of gas cycled as compared with 1940, which, in turn, showed a three-fold increase over 1939 operations. The paper covered every phase of investigation needed in contemplating cycling operations, and included in the appendix a suggested procedure in developing a cycling project which should find wide usage. (See p. 41, this issue.)

E. O. Buck, consulting engineer, Houston, discussed in more detail, the testing procedure in his paper, "Testing of Gas to Determine the Feasibility of a Recycling Plant." Field testing, he stated, has proven to be an economical and accurate method of determining whether the liquid content of wet gas is sufficient to justify the building of a cycling plant. The further factors of reserves, required wells, productivity index and operating economy were cited but the discussion was concerned mainly with field-test procedure and results. He further stated that "developed and proven but undeveloped reserves now available for this type operation exceed a potential capacity of 1,500,000,000 cu. ft. per day with an expected yield of some 45,000 bbl. of condensate."

All technical papers presented at Shreveport are printed in full or abstract form in the Engineering and Operation Section of this issue, beginning on Page 33.

A theoretical study of wave fronts swept out by dry gas in displacing wet gas in reservoir in cycling, was reported in the paper entitled "The Application of Electrical Models to the Study of Recycling Operations in Gas Distillate Fields," by William Hurts and G. M. McCarty, Humble Oil & Refining Co., Houston. An improvement on the work of earlier investigators was claimed in use of electrical models to determine location of output and input wells for fields under assumed ideal conditions of sand uniformity. (Digests of Mr. Buck's and the above papers are given beginning on p. 45.)

War and Control

Current affairs affecting the oil industry were given attention in another session. W. B. Heroy, president, Pilgrim Exploration Co., Houston, discussed "Oil and the European War," concluding with the realistic observation that "with the occupation of Rumania, it accordingly appears probable that Germany has obtained access to sufficient supplies of petroleum to take care of military requirements."

George A. Hill, Jr., president, Houston Oil Co. of Texas, outlined the workings and purposes of the interstate oil compact in his address entitled, "The Interstate Oil Compact as an Instrument of Democracy." Invitation to join the compact was again extended the State of Louisiana, represented among the speakers by Maj. B. A. Hardey, chairman of the Minerals Board of the Louisiana Department of Minerals.

After discussing the "new era" into which Louisiana has entered by means of reorganized state control bodies, a new model conservation statute and cooperative and conservative attitude on the part of the state, Mr. Hardey intimated that Louisiana would join the compact should Illinois become a member.

A wide selection of production and drilling subjects was included in the 2-day meeting.

E. P. Hayes, Texas Co., elected chairman, Southwestern district, A.P.I.

L. A. Ogden, Pure Oil Co., Fort Worth Tex., retiring chairman of division

Drilling in North Texas Is Most Active in State

(Continued from Page 16)

development of the field's regular 3,800 and 4,300-ft. Strawn pays continues as inside acreage is drilled or twin wells sunk to either of the two pays. Also, on the southwest side of the pool, discovery of a 4,650-ft. Strawn pay is proving to make acreage in that sector more valuable than it was thought to be in earlier stages of development. With some 25 rigs running, Hull-Silk is second only to K.M.A. in amount of drilling activity among the North Texas fields.

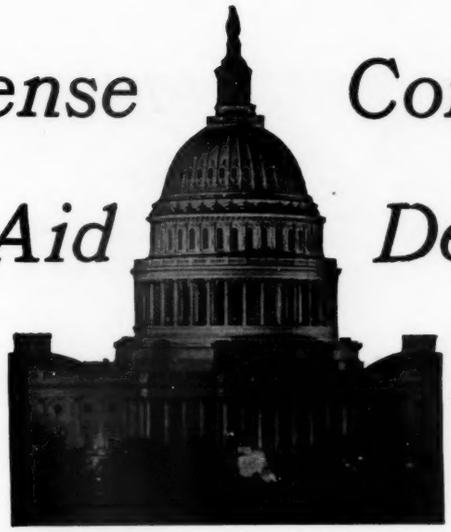
Shallow Developments

While interest is centered mainly in the deeper developments, search for and development of shallow oil production continues to account for much of the area's activity. In 1940 the average per-well depth of completions increased about 350 ft. as compared with 1939, from 2,300 to 2,650 ft., due to the large amount of drilling done in Hull-Silk, K.M.A. and the more recent deeper discoveries. This year, however, the average per-well depth is not expected to show any appreciable gain. This is due to the comparatively low allowables granted the deeper wells and the fact that a majority of activity in North Texas is carried on by independent operators. The average independent is not sufficiently financed to drill a large number of 5,000 and 6,000-ft. wells if some 15 to 20 years are required for a payout. Thus some of the area's most active operators are undertaking fewer deep wells and are seeking shallow production where the payout is quicker.

The shallow activity is largely confined along the trend of the Muenster arch in Cooke and Montague counties, along the axis of the Electra arch in northern Clay, Wichita and Wilbarger counties and along the Bend flexure in Young, Archer and Wichita counties. In other words, it is largely trend drilling in or near the district's oldest producing fields and, in effect, amounts to a redrilling of areas that have been subjected to more or less constant search since the days of Burkburnett's discovery. New pools, though small, are constantly being added as a result of this search and aid in keeping the area's oil production at a record volume.

Most active shallow drilling at the time is in the Voth pool of Cooke County, the Thornberry district of western Clay, southwest of Burkburnett and in the Bloodworth-Clark area southeast of Olney. So far this year over 20 producers have been completed in the 1,200 and 1,600-ft. pays of the Voth field whereas only 32 had been completed between its discovery in December 1938 and last January. In this field and in the 1,100-ft. T.C.U. field to the south, some 20 machines were running at the first of this month. In the old Petrolia-Thornberry district about 25 machines are drilling for the 1,050-ft. Thomas sand pays and 1,250-ft. Gunsight pays. Near Olney, where wells with potentials as high as 100 to 150 bbl. are being completed in an 870-ft. sand, more than a dozen spudders are being kept constantly busy drilling up a small field recently opened.

Export License Control Chief Weapon to Aid Democracies



By HENRY D. RALPH

WASHINGTON, D. C., Mar. 4.—The export-license-control system which had its inception in an effort to keep down scrap-iron prices on the West Coast has now developed into the administration's chief weapon of economic warfare against totalitarian powers and of material aid to the democracies.

Through one of the more recent license orders, for example, the administration can pretty effectively curtail the export of petroleum products to Japan without appearing to do so and without giving the Japanese any grounds for a diplomatic protest. This order requires a license for the export of metal drums suitable for holding liquid-petroleum products, whether filled or unfilled. The ostensible purpose is to conserve steel for national defense and other domestic needs, but it is not giving away any state secret to say that the principal result of this, and undoubtedly the principal motive, is to check Japanese purchases of American gasoline, lubricants and fuel oil.

High-octane aviation gasoline and aviation lubricating oil have been subject to export license for some months, but the Japanese have been buying considerable quantities of American gasoline with an octane rating just under our specification of aviation motor fuel. Because of the shortage of tankers and of bulk-storage facilities, Japan has been shipping much of her oil in drums on cargo vessels. Reports are that she has been storing large quantities of oil in the original drums on her mandated islands throughout the Pacific, much of it below ground as protection against possible aerial bombing. The Export-License-Control Act gives the Government authority to curtail the export of any article when a threatened shortage of it endangers national defense. Therefore, a good legal case could be made out for clamping down on exports of aviation gasoline but not for shutting off shipments of motor gasoline and other petroleum products of which this country has a surplus. But there is a tight situation in steel which justifies the licensing of steel-drum exports, and since there is just as much steel in a full drum as an empty one, the Government can shut off practically all Japanese purchases of petroleum products.

Official Attitude Friendly

Of course, the administration does not say that Japan or any other particular nation cannot purchase American gasoline in drums. Officially we are friendly with all countries. But every application for an export license must pass through the Division of Control of the Department of State and this division is so busy that frequently applications for export licenses remain there without action for a long time, or perhaps they have to be sent back to the applicant for more information. Maybe it is lack of system in the division, or maybe the supplies of exportable articles vary from day to day, but exporters report that it takes ever so much longer to get a license to ship to certain Pacific destinations than it does to ship the same commodities to other parts of the world. It seems that the State Department just can't get around to acting on certain applications; "the matter is still being studied—so sorry."

The list of commodities subject to export-license control has been expanding rapidly in the past few months until it now contains most articles essential in the production or operation of military equipment of which there is any possibility of a shortage, particularly commodities which must be imported. Few important additions are expected in the near future unless conditions change materially, but regulations and interpretations are being issued almost daily which clarify restrictions on some of the articles. The State Department is working on a compilation of these regulations, which should be valuable to all exporters, but it declines to reveal any information as to the quantities and destinations of the various exports it has licensed.

GREAT BRITAIN TO GET PETROLEUM PRODUCTS

WASHINGTON, D. C., Mar. 4.—The State Department today issued general licenses permitting unlimited export to Great Britain and northern Ireland of a long list of commodities, including petroleum, petroleum coke, gasoline, tetraethyl lead, lubricating oil, naphtha, drums and containers and steel tanks.

For some time the British Government has been complaining that American exports to the U.S.S.R. have been reaching Germany, or have been replacing Soviet goods sent to Germany, and there are evidences that the administration is responding by tightening up on export-license control. This may be the explanation for requiring licenses for the export of oil-well and refinery equipment, although the ostensible reason is to conserve steel. Russia has bought considerable quantities of oil-well equipment in recent months, and the inference could be drawn that Russia is increasing her oil production in order to supply Germany. The administration is attempting to avoid offending the Soviets and at the same time to comply with the British blockade, which probably explains why the Government lifted the "moral embargo" placed against Russia during the invasion of Finland but shortly thereafter tightened up export control. Apparently these controls are effective, for only last week the Soviet ambassador gave the State Department assurances that no imports from the United States are reaching Germany.

On exports to other countries also there is evidence that the Export-License Act is being used as a means of economic warfare against the Axis. Applicants for licenses to export a great many commodities to South American countries are required to submit affidavits giving information as to that country's consumption and imports of the products in recent years, history of recent dealings in this commodity between the exporter and the prospective purchaser, and information as to the needs of the importing country and uses to which the shipment will be put. The obvious purpose of all this is to prevent any country from building up a surplus of essential products which might be reexported to the Axis powers.

General License Feature

A recent innovation is the so-called general license under which all products covered by the license can be exported without special application. So far the only general license issued applies only to shipments to Canada, and this covers almost everything on the control list except plans and technical information for plants to produce aviation motor fuel and lubricating oil and tetraethyl lead. Unlimited licenses have also been issued for shipments for the use of the U. S. Government outside the limits of this country, and to the British Purchasing Commission and the British Iron & Steel Corp. for shipment to British possessions of all iron and steel products, including storage tanks for oil, water, or gas, complete or knocked down, and drums and metal containers, filled or unfilled, for oil, gas, or other liquids.

While not many new items may be added to the control list, it can be anticipated that fewer and fewer licenses will be granted except to the British Empire, China, Greece, and in limited quantities to South America to fill urgent needs.

There are recurrent reports in Washington that the administration is contemplating setting up something similar to the British Ministry of Economic Warfare in order to assist the British in their blockade of Germany and Italy, but whether or not this is actually done the administration has an effective tool in its export-license-control law, so there is every reason to believe that license control will be tightened all down the line.

Administration officials realize that there is much truth in the accusation of friends of China that the United States has been helping Japan to conduct her undeclared war on China by supplying all sorts of necessary materials. Now that Japan threatens to expand in the Pacific at the expense of French Indo-China, Great Britain, the Netherlands East Indies, and Australia, the Washington Government can be counted on to get tough. Japan is short of so many essential commodities that a practical embargo on supplies from the United States might be the determining factor in her military operations.

Some exporters are complaining bitterly about this situation, but such complaints make no impression on State Department officials. There has been no official announcement and probably will not be, but through actions rather than words exporters are being given to understand that foreign trade is now largely a matter of administration policy and must be subject to government control for the duration of the international emergency.

Most members of the North Texas Oil and Gas Association are independent operators. Here are three attending the annual meeting. Left to right: Ed Landreth, Fort Worth, Tex., president of Landreth Production Corp.; Dan Rubsam, land-department manager, and John F. O'Donohoe, president, Petroleum Producers Co., Wichita Falls

North Texas Oil Men Told To Expect Higher Taxes

WICHITA FALLS, Tex., Mar. 4.—Higher taxes for the Texas oil industry are inevitable, Lieutenant Governor Stevenson told those assembled here last Saturday for the annual meeting of the North Texas Oil and Gas Association. The industry can expect, he said, to pay a share of the taxes necessary to defray old-age pensions, meet requirements of the Teachers Retirement Fund, care for the state's blind, and aid the schools.

Before the lieutenant governor's address at the annual banquet, visiting oil men had heard Homer Leonard, speaker of the Texas House, declare that all business needs is to be let alone. The immediate relation of business and labor was outlined by Mr. Leonard. He said that nothing can happen to adversely affect business without directly or indirectly affecting the remainder of the nation.

Lieutenant Governor Stevenson said that it was up to natural-resource industries, utilities, and other corporations to pay the cost of government when all other property has assumed its maximum load. He advocated strict economy in government expenditures and a complete frankness on the part of officials to show the taxpayers exactly where the revenue is spent.

D. H. Bolin, Wichita Falls, retiring president of the association, presided at the meeting. New officers were introduced. They are C. J. Tucker, president; J. T. Harrell, first vice president; Fred Sehmann, second vice president, and D. G. Gray, executive president. Joe Bridwell, Wichita Falls independent operator, introduced Lieutenant Governor Stevenson. Mr. Leonard was introduced by C. P. McGaha, a past president of the association.

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Finnegan Resigns as Assistant to Wiess

HOUSTON, Tex., Mar. 4.—W. N. Finnegan, Jr., assistant to the president of the Humble Oil & Refining Co., will enter the field of independent oil operations. Announcement of his resignation was made here last week by Harry C. Wiess, president.

"We regret very much to lose Mr. Finnegan from our organization," Mr. Wiess said. "He has been with us some 22 years, and has been a very valuable and trusted employe in whom we have had every confidence. Naturally, we wish him every success in his private undertaking."

Mr. Finnegan served as assistant under W. S. Farish, now president of the Standard Oil Co. (New Jersey); R. L. Blaffer, now chairman of the Humble board, and for the past few years under Mr. Wiess.

Canada Fixes Prices on Oil Products

OTTAWA, Ont., Mar. 4.—G. R. Cottrelle, Toronto, Canadian oil controller, has been empowered to fix maximum and minimum prices at which petroleum products may be sold or offered for sale in any part of the country.

No explanation was made immediately as to w'y the price-fixing authority had been considered necessary. It was believed, however, to be a precautionary measure to prevent prices from rising too sharply because of the war emergency.

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THE MARKETS*

CRUDE OIL: Two Texas fields, Talco in East Texas and Slaughter-Duggan in the West Texas Permian Basin received first crude postings last week from new purchasing companies. Entry of purchasers into new fields is symbolic of the competition for new connections. Elsewhere the crude market is strong with general postings unchanged.

REFINERY: Gulf Coast refiners have advanced gasoline prices 1 cent per gallon by stages during the past 3 weeks. Fuel-oil prices are soft, particularly among the distillate grades. Offerings of No. 2 fuel at 2⅞ cents per gallon were reported from the Gulf Coast.

TANK-WAGON AND POSTED-DEALER: Kerosene and other grades of light fuel oil have been reduced at several eastern marketing points. Conditions in the gasoline market are steady. There are a few depressed spots but in general motor-fuel prices are stiffening in sympathy with refinery quotations.

FINANCIAL: Oil securities rallied slightly but lost ground at the close. Average of 30 representative stocks for the week ended March 1: High, 22.35; low, 21.82; close, 22.04. Week ended February 22: High, 22.31; low, 21.75; close, 22.07.

*Detailed information in the Market Section.

DEATHS

WILLIAM J. BROWN, for many years a driller in the Ontario fields as well as in Persia and California, died at Wyeming, Ont., last week. He was 55.

JOHN BARNESON, 79, one of the organizers of the General Petroleum Corp. and for many years a top executive of that company, died February 25 at his home in Hillsborough, Calif. He built the first oil pipe line in California, from Coalinga and Monterey and later expanded the system south over Tejon Pass. He formed the General Pipe Line Co. and became associated with the Esparanza Consolidated Oil Co. which he helped expand into the General Petroleum Corp. Mr. Barneson was a vice president of the Standard Oil Co. of New York from 1926 to 1928 when he retired from active business. Three sons and a daughter survive.

FRED T. MANLEY, 60, a retired vice president of the Texas Co. which he served as head of the refining division for several years, died February 25 at Miami Beach, Fla., where he was stricken by heart failure. Mr. Manley was coinventor of a number of oil-refining processes. His best-known contribution is the Holmes-Manley cracking process which is still in general use. He was born in Singlehouse, Pa., in 1880 and went to Texas in 1902 where he joined the Texas Co. at Spindletop as a laborer. He aided in construction of the Port Arthur, Tex., refinery in 1903 and remained there for 14 years. He then moved to Houston and served as an executive of refining operations for 12 years. For 10 years prior to retirement in 1939, Mr. Manley lived in New York where he directed all company refining operations. A. E. Manley, a surviving brother, New York, is superintendent of terminals for the Texas Co.

ROBERT S. McCRAY, 54, oil producer in the Pennsylvania fields, who resided near Titusville, Pa., died February 22 in the Veterans Administration Hospital at New York City following an extended illness. He served with the A.E.F. in France.

HARVEY B. LYNN, 62, field foreman for Columbia Gas & Electric Co. in Clarion County, Pennsylvania, died at his home in Shippenville, Pa., February 27.

LEO LUDLOW, 57, died March 3 in a Tulsa hospital after an illness of 2 weeks. Death was caused by a heart ailment. Mr. Ludlow came to Tulsa about 25 years ago and joined the legal department of the Tidal Oil Co. Later he formed his own lease and production concern. His widow and a son survive.

CLARENCE FINLEY McDORMAN, 76, an oil driller and tool dresser who had lived in Tulsa for nearly 30 years, died at his home last week. Survivors include his widow, two daughters and a son.

BURGESS CALVIN ACUFF, 37, tool pusher for Olson Drilling Co., died of diabetes at Madill, Okla., February 17, and was buried at Sallisaw, Okla. He was born October 21, 1903, at Narcissia, Okla. Since 1930 Mr. Acuff had been employed by Olson Drilling Co. and prior to that time had been with the Noble Olson Drilling Co., starting with that firm in 1925. He is survived by the widow and three children.

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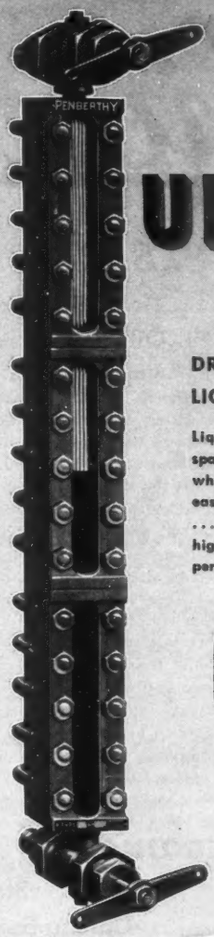

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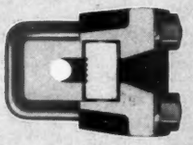
Liquid shows black—empty space shows white. Preferred wherever liquid level must be easily and positively visible . . . and when liquids are under high pressure or at high temperature.



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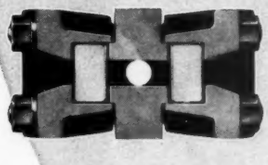
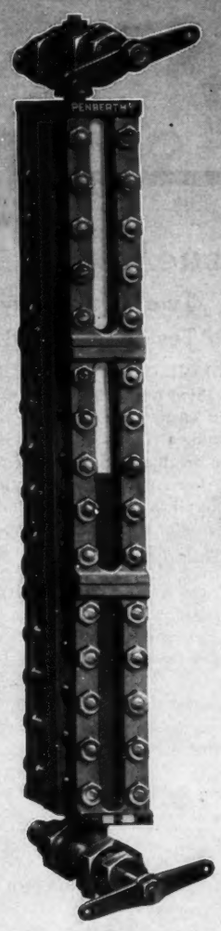
Used to observe color and density of liquids under high pressures, and/or temperatures. Construction is exceptionally rugged . . . similar to Reflex types.





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WATER GAGE SET

Water shows black—steam shows white. U-bolt construction is strongest and simplest to service. Glass replaced by simply removing nuts on face of gage . . . unnecessary to work between gage and boiler.

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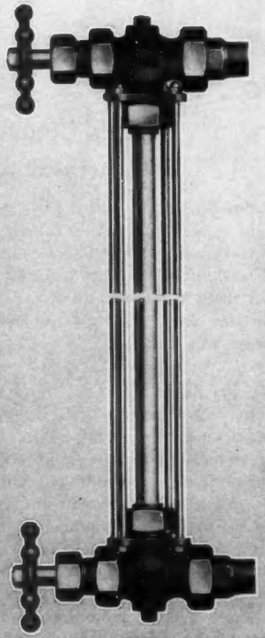
Made of Chromium-molybdenum alloy temperature-resisting steel, extra heavy throughout. Stainless steel trimmed. Tubular glass type gages also available in various other metals suitable for practically all conditions.



PENBERTHY INJECTOR CO.

DETROIT, MICHIGAN • Canadian Plant: Windsor, Ontario

PENBERTHY PRODUCTS

International

Venezuela . .

Two Lower Pay Sections Tested in New Roble Well

STANDARD OIL CO. OF VENEZUELA has completed a third producing well on the El Roble concession in eastern Venezuela which is being developed under a contract with Pantepec Oil Co. of Venezuela, original owner of the property. Locations have been made for two additional tests and a fourth well is nearing completion.

The latest producer on the Pantepec acreage is 3 Roble, about ¾ mile east of the 1 Roble discovery. Standard and Pantepec 3 Roble produced 1,291 bbl. of 42° A.P.I. gravity oil through ⅝-in. choke from sand at 9,627 to 9,650 ft. and 936 bbl. of the same gravity oil from three sands in the interval from 9,450 to 9,530 ft., making an aggregate of 2,200 bbl. from the four zones tested.

Both pay sections tested in the third Roble well are lower than those producing in the other two wells, according to W. F. Buckley, president of Pantepec.

Standard and Pantepec 4 Roble is drilling below 9,170 ft. and is scheduled for completion by April 1.

Locations have been made for 5 and 6 Roble.

The Roble field is in the State of Anzoategui, about 50 miles north and a little west of the Oficina field. El Roble is now connected to the Oficina pipe line terminating at Puerto la Cruze on the northern shore of Venezuela. Production from the El Roble field averaged about 3,000 bbl. daily during December and January.

Mexico . .

Reports Conflict on Settlement Progress

REPORTS from Mexico City that the Mexican Government is now negotiating directly with the expropriated United States oil companies, inferring that a settlement may be imminent, lack confirmation in their full connotation. Authoritative sources in New York said that no settlement had been reached and that none is in immediate prospect.

Rumors have circulated from Washington and other sources in recent weeks that negotiations between the Mexican Government and the expropriated companies had reached an advanced stage. Some of the rumors have been linked with the Department of State and the Mexican ambassador to the United States. The Washington rumors have hinted that official conversations between the two governments include all disputed issues. Besides the conflict over expropriated oil properties there are unsettled issues arising from agrarian land seizures, Rio Grande boundary dispute, and defalcation on Mexican railroad bonds.

Ezequiel Padillia, foreign minister, announced at his press conference in Mexico City last Saturday that his government is now "negotiating directly with United States oil companies" to settle the 1938 expropriation conflict and that he is "hopeful" that an understanding will be reached before long. The foreign minister said that all pending issues, except the oil expropriation and the El Paso, Tex., land claim, were being discussed by representatives of the Mexican and United States governments in Washington.

Information from outside sources indicates that negotiations on the oil expropriation issue now revolve around a long-term lease under which private companies would be reinstated in the management of properties. The Mexican Government would retain a substantial interest during the life of the lease. Complete ownership would revert to the government at the end of a specified term, perhaps 25 years or longer. Mexico settled claims of Sinclair companies by agreeing to pay $8,500,000, part of which has been paid.

The suggestion that a long-term lease arrangement might be negotiated was first advanced in 1938 by the expropriated companies shortly after the decree barred them from Mexico for refusal to accept provisions of a labor award.

Pres. Manuel Avila Camacho, who pledged an administration fostering industrial development, has resumed talk of a lease relationship with the oil companies. Since his induction to office, President Camacho has consistently pressed for a reduction in personnel of Petroleos Mexicanos, the government oil company. The Mexican oil industry accumulated an operating deficit variously estimated at 70,000,000 to 150,000,000 pesos from March 18, 1938, to December 1, 1940, under the administration of of ex-President Cardenas.

More than 3,000 oil workers have been dismissed since last December and additional retrenchment in personnel is planned.

A more conservative leadership for the Mexican petroleum workers has been promised by Fidel Velazquez, who will soon succeed Vicente Lombardo Toledano as president of the Mexican Confederation of Workers.

The refining branch of the industry has been hardest hit by withdrawal of the private oil companies. European markets for Mexican products have been closed since the war started. Most shipments to the United States have consisted of crude. The incentive to maintain refinery capacity at maximum efficiency has been subdued with a bulk of demand concentrated on crude. Consequently, Mexican petroleum exports now consist of about 75 per cent crude and 25 per cent refined products. Prior to expropriation the ratio of crude shipments to products was approximately reversed.

Spain . .

Two Refineries Planned To Ease Fuel Shortage

THE Spanish petroleum monopoly, C.A.M.P.S.A., is reported planning construction of a refinery complete with storage facilities and a tidewater terminal at the harbor of Santander in northern Spain.

A new company has been organized in Madrid, the Distilleria Espanola de Puertollano, S.A., for the purpose of building a new plant at Puertollano for production of motor fuel from coal.

U. S. S. R. . .

Geological Parties Discover Oil Showings on Arctic Coast

GEOLOGICAL parties sent out by the Great Northern Sea Route administration have been working for 2 years at various points on the shores of the Arctic Ocean exploring for coal and oil, according to the Soviet press. At the mouth of the Yenisei River and near Dikson Island, deposits of millions of tons of coal and traces of oil and gas have been located. Drilling to 6,000 ft. is now under way. Drilling at Nordvik disclosed 14 oil-bearing horizons now being tested. More coal reserves were mapped at Ugobnaya Bay.

An experiment with casingless drilling under Arctic conditions proved successful and much more rapid than when pipe was used. A method of seismic exploration, which dispenses with test drilling, was also proved feasible.

Work is to be continued in 1941 by 13 expeditions composed of 2,000 members who will operate in various sections of the Arctic.

Rumania . .

British Start Task of Cutting Reich Oil Supply

BOMBING of Rumanian oil fields by the British, predicted as an inevitable outgrowth of the German movement through the Balkan countries, started last week. Reports were vague and inconclusive but were assigned significance from a standpoint of logic. Reports have circulated that Germany is depending on Rumania for 25,000,000 to 30,000,000 bbl. of oil this year with which to prosecute the war. Importance of this supply in fueling the Reich air force and mechanized units is obvious to the British, who will make all possible effort to sever the flow of essential petroleum.

Limiting factors are so numerous that military significance of the British bomb attack on Rumanian oil fields is not great. Fields, refineries and storage are vuinerable because of their aboveground position but a virtual blanket of bombs would be necessary to inflict stoppage of operations. British bombers operating from bases in Greece are within 300 miles of the Rumanian fields clustered around Ploesti.

Prior to the war, Germany received 25 per cent of Rumania's petroleum exports, amounting to 25,000 bbl. daily. About 45,000 bbl. daily was divided nearly equally between Great Britain, France and Italy. Cessation of Rumanian shipments to western European destinations along with smaller amounts previously moving to Scandinavia has raised the amount available to Germany to around 75,000 bbl. daily.

Production of synthetic motor fuel from coal hydrogenation in Germany is estimated at 70,000 to 100,000 bbl. daily. Synthetic fuel and Rumanian exports combined give Germany a potential supply of all oils aggregating 65,000,000 bbl. annually. Other supplies from the Polish fields and imports from the U.S.S.R. are estimated at 12,000,000 to 15,000,000 bbl. annually.

Teamwork

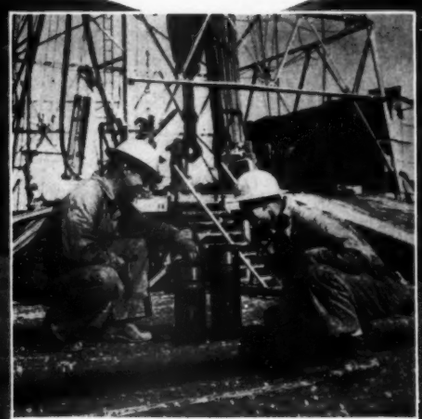
For 1941 Model CASING JOBS

The guiding and floating combination presented here is the accepted method of numerous Gulf Coast Operators for running and cementing long oil strings. The combination has proved to be extremely safe and highly satisfactory, and is recommended, man for man, by users of it.

The combination consists of a Larkin Ball Type Float Collar run one or two joints above a Larkin Bakelite Guide Shoe. The strong, tough guide shoe steers the string safely past hard shoulders, through any crooked hole, and easily spuds through any bridge . . . yet is undamaged when it reaches bottom. The positive acting, leak-proof ball valve in the Larkin collar floats the string, regardless of weight, safely and steadily down. The arrangement of the combination places the back pressure valve far enough up the casing to prevent damage by any foreign material which may be forced into the open casing end. The collar stops the cement plug, keeping "cement tailings" in the casing and allowing only good cement to set around the shoe joint and casing.

It's a method you, too, will profit by using, especially on deep well casing programs. It's teamwork by a pair of products you'll not be able to beat!

Larkin has consistently built super strength cementing equipment, at no premium cost to the user. See full details and prices on the complete line in your 1941 Composite Catalog, pages 1417-1427.



They know the advantages of the Larkin Guide Shoe—Float Collar Combination.

LARKIN

LARKIN PACKER COMPANY, INC., St. Louis, Mo.

WAREHOUSES: Houston, Corpus Christi, Odessa, Shreveport, Tulsa, Great Bend, Salem.
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Refinery Expansion

Ashland Pursuing Gradual Refinery-Expansion Program

The Ashland Oil & Refining Co. is making further additions to its Ashland, Ky., refinery most recent of which is the erection of equipment to permit the plant to crack a larger proportion of the crude processed. The capacity of the Dubbs cracking unit is being increased from 4,000 to 6,000 bbl. per day and the resulting balancing of distillation and fractionating facilities is providing 1,200 bbl. daily additional reforming capacity and 3,000 bbl. per day additional crude capacity. At present the plant is running about 10,000 bbl. of crude daily and with the completion of the work now well in progress the plant will be able to process up to 13,000 bbl.

Chalmette Completes 4,000-Bbl. Copper-Sweetening Unit

NEW ORLEANS, La.—According to an announcement by F. E. Holsten, vice president, Chalmette Petroleum Corp. has started operation of a 4,000-bbl. Perco copper-sweetening unit for the New Orleans refinery. This unit is of the conventional Perco design for refinery light-oil treating and was constructed by L. S. Gregory Co. of Tulsa. This unit will process gasolines from Gulf Coast crudes, formerly processed by a doctor-treating system.

British American to Build Lubricating-Oil Plant

TORONTO, Canada.—The British American Oil Co. has received from G. R. Cottrelle, dominion oil controller, authorization for the construction of a lubricating-oil refining unit near Toronto. The plant will be erected on the Lakeshore Road near Clarkson. A 192-acre site has been purchased with a ¼-mile frontage on Lake Ontario to be used as a port for tankers.

Construction will commence as soon as weather conditions permit and structural steel is available. The plant will cost approximately $3,000,000 and an operating and maintenance staff of 150 will be required. The annual capacity will be about 300,000 bbl. of lubricating oils. Crude for the plant will be imported by tanker from the United States.

Recycling News

Grapeland's Condensate Shipments Increase

PALESTINE, Tex.—Shipments of gasoline, butane, and condensate from recycling plants in the Grapeland and Palestine, Tex., districts now average about 30 cars daily.

Three plants in the Grapeland field, Houston County, shipped 525 cars of products in January and 365 cars moved from the four recycling plants in the Long Lake area of Anderson County.

Magnolia Projects First Oklahoma Recycle Plant

Plans to develop a virtually unexplored area of western Oklahoma for production of gas distillate through a recycling plant, the first in the state, were revealed this week by the Magnolia Petroleum Co. in a request to the School Land Board to join in a communitizing agreement for the area.

The company holds a block of 9,600 acres under lease surrounding a wildcat, Magnolia 1 Feikes, SW SW 31-18-14w, which was junked last July at a depth of 9,400 ft. The well, however, had gas with pressure estimated at 2,800 lb., and the company stated it had reason to believe the area was suitable for a recycling operation.

Louis Campbell, Oklahoma manager for the company, pointed out to the school board that such a project would be very expensive, with the cost of the plant running between $1,000,000 and $2,000,000 in addition to the cost of drilling the wells.

After taking the request under advisement, the commission asked the attorney general to give an opinion as to whether it could legally enter into a communitizing agreement. A ruling is expected in a few weeks.

MALCO REFINERIES, INC., PLANT AT ARTESIA, N. M.

One of the most modern refineries in Southeast New Mexico is that of Malco Refineries, Inc., at Artesia, N. M. The plant has a topping capacity of 2,000 bbl. daily and a cracking capacity of 1,000 bbl. Crude is supplied largely from properties of the Maljamar Oil & Gas Corp., an affiliated company, in the Maljamar field of western Lea County. In order to increase the lead susceptibility of its motor fuels, the company will shortly start construction on a desulfurization unit. A view of the cracking furnace and towers, with the remainder of the plant in the background, is shown in the accompanying photograph.

Natural Gas

Revenues From Gas Sales Show 12.3 Per Cent Gain

NEW YORK. — Revenues of natural-gas utilities amounted to $51,229,800 in December 1940, 12.3 per cent more than for December 1939. Revenues from sales of natural gas for industrial purposes gained 7.1 per cent, while revenues from sales for domestic purposes increased 14.5 per cent. Figures are reported by the American Gas Association.

Acetylene and Acetic Acid May Be Gas Byproducts

AUSTIN, Tex.—Conversion of natural gas into acetylene is one of the projects now receiving extensive study by Texas chemists, according to Dr. E. P. Schoch of the University of Texas. Speaking recently before the Texas Senate finance committee, Dr. Schoch revealed also that production of acetic acid, which is used extensively in manufacture of cellulose plastics, may be commercially attractive in the near future, using natural gas as the raw material.

"We have been working many months on our process," said Dr. Schoch, "and it is almost ready for a final test. Germany is now using a variation of this process, and we are going to test both methods and then, on making a final decision, we will be ready to go. It not only will vastly increase the use of our natural gas, but it will enable us to stop gas wastage."

Natural Gasoline

California Natural-Gasoline Stocks Decline in January

Stocks of natural gasoline in California decreased from 1,983,134 gal. on the first of January to 1,184,328 gal. on January 31, the Bureau of Mines reported last week. Daily natural-gasoline production from 87 operating plants, with a gas capacity of 2,055,800,000 cu. ft., totaled 48,786,424 gal. the monthly report showed.

Following is a summary of production by districts for January and of distribution of natural gasoline:

	Gas treated (1,000 cu. ft.)	Natural gasoline produced (gal.)
San Joaquin Valley:		
Belridge	4,391,181	2,606,308
Elk Hills	525,626	472,667
Kettleman Hills	9,051,428	10,482,425
Midway-Sunset	859,872	1,651,985
Mountain View	174,061	234,469
Miscellaneous	1,990,108	1,116,882
Coastal district:		
Elwood	414,257	443,664
Santa Maria	186,159	423,916
Ventura Avenue	3,510,185	5,031,312
Miscellaneous	676,330	642,689
Los Angeles Basin:		
Brea-Olinda-Coyote	440,082	1,530,274
Dominguez	1,317,317	1,911,293
Huntington Beach	748,111	2,563,650
Long Beach	2,140,088	7,427,402
Montebello	1,822,258	1,891,450
Richfield	175,804	580,121
Rosecrans	1,448,163	1,537,239
Santa Fe Springs	1,221,233	4,661,555
Torrance	202,703	666,727
Miscellaneous	1,682,527	2,910,396
Total (all fields)	32,977,493	48,786,424

DISTRIBUTION

	(Gal.)	(Gal.)
Stocks beginning of month	1,983,134	
Production during month	48,786,424	
Delivered to refineries		48,906,410
Delivered to jobbers, brokers, or blenders		
Blended at plants for production of motor fuel		14,586
Losses		34,234
Stocks end of month		1,814,328
Total	50,769,558	50,769,558

PROGRAMS AND MEETINGS

Seven Papers on Program of Pacific Coast A.P.I. Meet

The spring meeting of the Pacific Coast district, Division of Production, American Petroleum Institute, will be held March 11, at the Biltmore Hotel, Los Angeles, Calif. The following program has been arranged.

Morning Session, 9:30 a.m.—Ballroom

Presiding: E. W. Webb, Continental Oil Co., Los Angeles, chairman, California Topical Committee on Drilling Practice.

"Recently Developed Methods for the Inspection of Tubular Goods and Sucker Rods," by Hugh M. Henderson, Standard Oil Co. of California, Los Angeles.

"Some Factors Which Influence the Choice of Drilling Equipment," by V. J. Beissinger, Richfield Oil Corp., Los Angeles.

"Voluntary Curtailment Program of California Oil Producers," by A. H. Bell, Continental Oil Co., Los Angeles, chairman, Conservation Committee of California Oil Producers.

Afternoon Session, 2 p.m.—Ballroom

Presiding: T. H. Acres, Richfield Oil Corp., Los Angeles, chairman, California Topical Committee on Production Practices.

"Vocational Training in Oil and Gas Production," by W. L. Bagby, Shell Oil Co., Inc., Ventura, Calif.

"Core Analysis Interpretation," by Norris Johnston, General Petroleum Corp. of California, Vernon, Calif.

"Recent Equipment for Paraffin Removal, Perforation Cleaning and Well Completion," by Benton Turner, Drilling & Exploration Co., Inc., Los Angeles, Calif.

Evening Session, Dinner, 7 p.m.—Biltmore Bowl

Presiding: R. N. McMaster, Chanslor-Canfield Midway Oil Co., Los Angeles, chairman, Pacific Coast district, Division of Production.

"Industrial Relations," by Arthur H. Young, visiting lecturer in industrial relations, California Institute of Technology.

Panhandle A.P.I. Chapter Program Promises Interesting Papers

The oil industry in the Texas Panhandle area and the officers and members of the Panhandle chapter, Division of Production, American Petroleum Institute, with headquarters in Pampa, are rapidly completing arrangements for the annual spring meeting of the Mid-Continent district to be held in Amarillo, Tex., March 21-22, in the Herring Hotel.

All of the necessary committees have been appointed and have been active in completing plans for the comfort, convenience, and edification of visitors.

The program is in the hands of a committee headed by C. H. Keplinger. This is his third year of continuous service in an important official capacity.

There will be one general session on Friday afternoon, March 21, devoted to subjects of current interests.

H. M. Stalcup, vice president of the Skelly Oil Co., Tulsa, will discuss the relationship of the oil industry and its readiness and preparedness to serve the nation in its present emergency with oil.

Andrew F. Schoeppel, chairman of the Kansas Corporation Commission, Topeka, Kans., will discuss "State Regulation of the Oil Industry." Kansas is sponsoring a constructive conservation program.

J. H. Mitchell, director of industrial relations for the Carter Oil Co., Tulsa, will discuss personnel relationships in the oil industry. The oil industry, as a whole, has enjoyed amicable and fair relationship between its various working branches, which has been accomplished by intelligent leadership and understanding. Mr. Mitchell's address will be a timely and constructive contribution.

The program committee has selected many other topics of current interest as follows, which are now in course of preparation.

One session will be devoted entirely to secondary recovery in the Mid-Continent area. The following papers are now in course of preparation on this subject:

"Secondary Recovery in the Rocky Mountain Region," by C. F. Barb, Colorado School of Mines, Golden, Colo.

"Water Flooding in Oklahoma," by L. M. Arnold, Geologic Standards Co., Tulsa.

"Water Flooding in Kansas," by R. C. Earlougher, Geologic Standards Co., Tulsa.

"Secondary Recovery, Nowata Area, Oklahoma," by L. L. McWilliams, Phillips Petroleum Co., Bartlesville, Okla., and R. M. Carr, Sinclair Prairie Oil Co., Tulsa.

Another session will deal with the care and economics of internal-combustion engines, including gas-lift developments and acidizing, as follows:

"Care and Maintenance of Diesel Engines."

"Economics of Multicylinder Engines in the Oil Industry."

"Gas-Lift Developments."

"Gas-Well Acidizing in the Texas Panhandle."

The remaining session will be devoted to general problems of cements and cementing practices, etc., as follows:

"Method of Determining Well Potential by Pressure or Fluid-Level Draw-Down Measurements."

"Kansas Oil-Well Cementing Problems."

"Use of Gel Cements in the Mid-Continent Area and Their Properties."

"Measurement of Oil and Gas Shows in Drilling Mud."

"Installation and Maintenance of Oil-Field Tanks."

CALENDAR

March

AMERICAN PETROLEUM INSTITUTE, Illinois Basin chapter, Mount Vernon, Ill., March 7.

NATIONAL DIXIE DISTRIBUTORS, INC., Fort Worth, Tex., March 10.

AMERICAN PETROLEUM INSTITUTE, Pacific Coast District, Division of Production, regular spring meeting, Biltmore Hotel, Los Angeles, Calif., March 11.

INDIANA INDEPENDENT PETROLEUM ASSOCIATION, spring convention and refiners' and suppliers' exhibit, Hotel Severin, Indianapolis, Ind., March 11-13.

SOCIETY OF AUTOMOTIVE ENGINEERS, national aeronautics meeting, Washington Hotel, Washington, D. C., March 13-14.

OKLAHOMA UTILITIES ASSOCIATION, annual meeting, Tulsa, March 17-18.

OIL BURNER INSTITUTE'S NATIONAL OIL BURNER PROGRESS EXHIBITION, Commercial Museum, Philadelphia, Pa., March 17-22.

MID-CONTINENT CHAPTER, AMERICAN PETROLEUM INSTITUTE, spring convention, Herring Hotel, Amarillo, Tex., March 21-22.

OIL TRADES ASSOCIATION OF NEW YORK, annual meeting, Waldorf-Astoria Hotel, New York. March 25.

PACIFIC COAST GAS ASSOCIATION, annual spring technical conference, technical session, Los Angeles, Calif., March 27-28.

April

AMERICAN ASSOCIATION OF PETROLEUM GEOLOGISTS, twenty-sixth annual meeting, Rice Hotel, Houston, Tex., April 2, 3, and 4.

AMERICAN CHEMICAL SOCIETY, St. Louis, Mo., April 7-11.

MIDWEST POWER CONFERENCE, fourth annual meeting, Palmer House, Chicago, April 9-10.

PERMIAN BASIN ASSOCIATION, third annual convention, Lubbock, Tex., April 14.

SOUTHWESTERN GAS MEASUREMENT SHORT COURSE, College of Engineering, Oklahoma University, Norman, Okla., April 15-17.

WESTERN PETROLEUM REFINERS ASSOCIATION, annual meeting, Arlington Hotel, Hot Springs, Ark., April 16-18.

Nearly 500 Oil Men Gather At Meeting in Evansville

Nearly 500 oil men and civic leaders from the Illinois-Indiana-Kentucky area attended a gathering at Evansville, Ind., February 28, to hear Russell B. Brown, chief counsel for the Independent Petroleum Association of America, discuss the relation of oil to national defense. The meeting was sponsored by all the oil groups active in the Tri-State area and by business and civic groups. A. R. Thompson, independent producer of Mattoon, Ill., made arrangements for the gathering and was chairman of the meeting.

Mr. Brown outlined the recent history of the oil business and pointed out that the best answer to federal control at this time is the complete satisfaction of the requirements placed on the petroleum industry by the defense program. Enactment of some conservation legislation by states which now have none would demonstrate that the industry is able to discipline itself and does not need national control. The talk was followed by Mr. Brown's answering questions from the audience.

Kansas' Governor Addresses Accountants on Federal Legislation

Use of national-defense exigencies as an excuse for encroachment of federal regulation of the petroleum industry was ridiculed by Gov. Payne Ratner of Kansas in an address before the Petroleum Accountants Society of Oklahoma in Tulsa February 27. The occasion was the annual "executive night" dinner attended by nearly 400 oil-company executives, public officials, civic leaders, and members of the society.

The enviable record of service amassed by the oil industry in the previous World War and the progressive strides it has made in the intervening years of peace show the capabilities of the business, Governor Ratner declared.

"A certain group in this country, obsessed by the theory of centralized government, which sees only its blessings and none of its blight, would bind the sinews of the petroleum giant with bureaucratic tape," the Kansas governor declared.

Designs of central-control proponents on the petroleum industry were used by Governor Ratner to illustrate a danger to all business and theories of government. He called for a militant scrutiny of all legislation that centralizes government functions removing them from the people where close contact can be maintained.

C. C. Herndon, vice president of Skelly Oil Co., introduced the governor. Norman Cross, Tulsa, president of the Accountants Society, presided. He gave a brief review of the society explaining that it afforded a forum through which common problems were often cleared. Several visitors from the Kansas society were guests and were introduced along with directors of the Oklahoma group and several company executives.

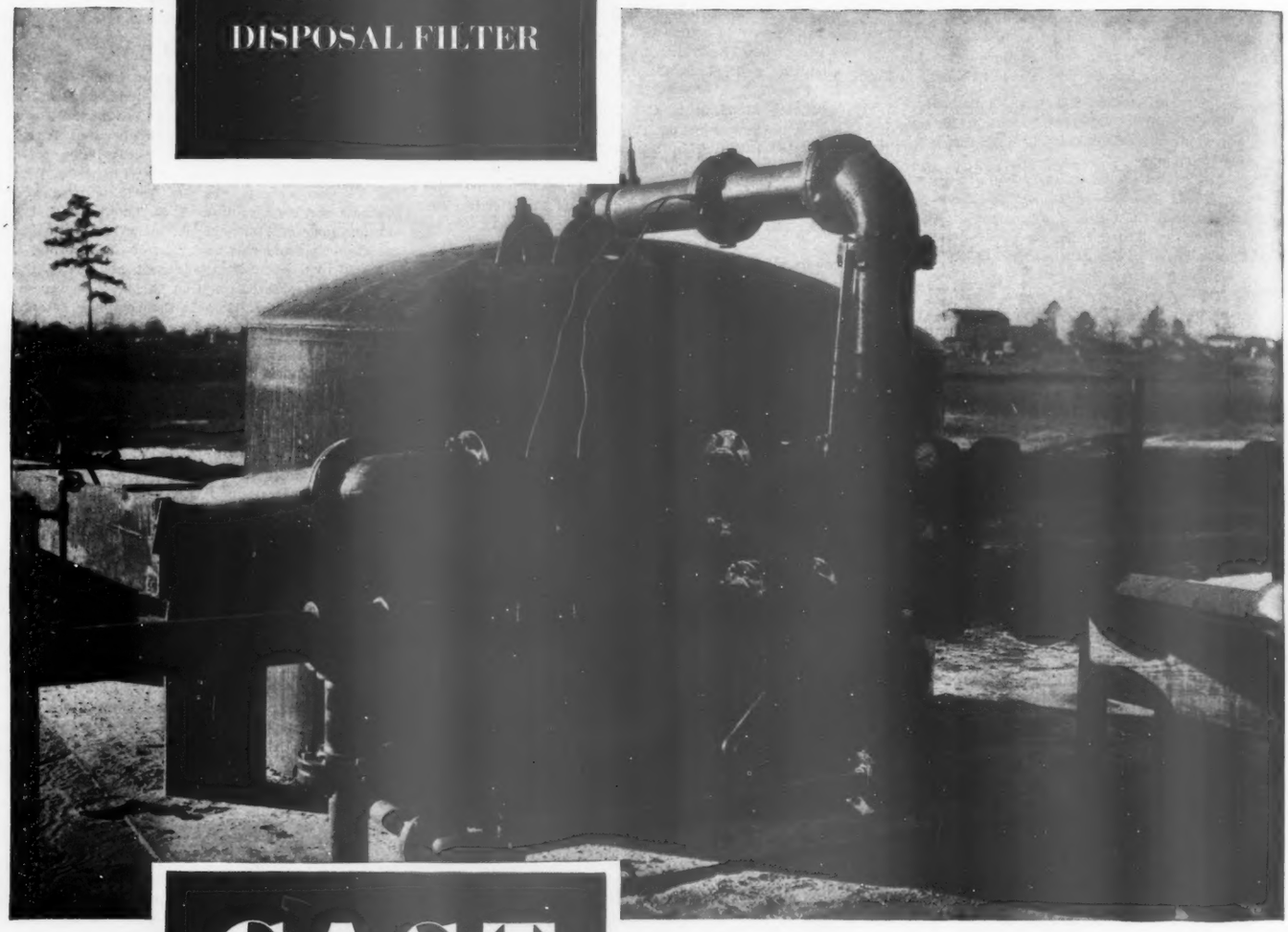
Oil-Well Drillers to Meet

The first meeting of the Houston region of the American Association of Oil-Well Drilling Contractors will be held at the Lamar Hotel, Houston, Tex., March 6. J. E. Brantley, president, Drilling & Exploration Co., Los Angeles, Calif., will be the principal speaker, and will discuss organization meetings held in California, Oklahoma, and Louisiana.

Magnetic Storm

TUCSON, Ariz., Mar. 4.—Severe storm began February 28, 10 p.m., and ended March 2, 11 p.m.

DEPENDABLE CAST IRON PIPE USED FOR A SALT WATER DISPOSAL FILTER



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For Longer Life and Economy

THE REAL PRICE you pay for pipe is not shown by the invoice but by what that pipe does to your maintenance costs. Longer life through greater resistance to corrosion can make higher-first-cost pipe a bargain. Performance considered, the cost of standard or alloy cast iron pipe is low. Its range of usefulness to the petroleum industry is wide. It is obtainable in bell-and-spigot, plain and threaded ends and flanged types, or with stuffing-box mechanical joints, in diameters from 1¼ to 84 inches. Address inquiries to The Cast Iron Pipe Research Association, Thomas F. Wolfe, Research Engineer, 1015 Peoples Gas Building, Chicago.

In most oil fields gas for drilling purposes is supplied by producers as they are completed so that in earlier stages of development gas shortages are not uncommon. In the Hawkins field of eastern Texas an 18-in. main line runs through the field to Dallas and Fort Worth. The positive meter installation shown here measures gas from the 18-in. line into a 4-in. line laid to serve drilling rigs. The 4-in. field line, 9 miles in length, circles the company's properties and is built so that gas can be fed both ways from this junction

ENGINEERING & OPERATION

In This Section

MARCH 6, 1941

Removal of Paraffin by Electrical Heating

. . . from producing wells in the Texas Panhandle

By BENTON TURNER and C. R. RIDER
Los Angeles, Calif. Dallas, Tex.
Drilling & Exploration Co., Inc.

THE application of electric heaters to oil wells to raise the temperature of the oil sufficiently to put or keep the paraffin in solution has been attempted by several operators during the past 20 years. However, the methods used to secure this result have been such that their use generally has not been adopted because not economical. The system to be described is now successfully used in over 125 wells in the Texas Panhandle field.

Basically the method supplies heat to melt the paraffin in the tubing by passing a direct current through the tubing and rods and using them as elements of a resistance heater. The tubing is insulated from the tubing head and casing by special insulators. At a point in the well below which paraffin is known to form, contact is made between the tubing and casing to complete the circuit to the surface. Heat is generated in the tubing and rods rather than in the casing because the former have a smaller metal area with a consequent higher resistance.

Current is supplied at the surface by a direct current, shunt wound, high amperage, low voltage generator. Contact is made to the well head by means of removable cables, the tubing being used as the positive and the casing being used as the negative terminal. A schematic assembly of the complete layout is shown in Fig. 1.

Obviously some special well equipment is necessary. The items permanently installed in a well are as follows:

Tubing-Head Insulator

In Fig. 2 are shown dimensions of the tubing-head insulator generally used in the Panhandle field. The insulator is made of neoprene which is fiber inserted to provide added strength for supporting the weight of the tubing. The skirt of the insulator is ⅛ in. thick and extends 1½ in. upwards from the seat to prevent any contact between the upper lips of the tubing hanger and the casing head. Similarly, a skirt of the same thickness extends 2½ in. downward from the seat to prevent any shorting of the current between the tubing or tubing head and casing. No alteration in the tubing head is necessary when installing the insulator. During the past year, no short circuit has occurred through this insulation in any of the wells thus equipped for electrical heating. Fig. 3 shows the insulator just previous to being seated in the tubing head.

A.P.I. ABSTRACT

A process for intermittently removing paraffin accumulations from the tubing of pumping wells by electrical heating is described. Basically the method supplies heat to melt the paraffin in the tubing by passing a direct current through the tubing and rods and using them as elements of a resistance heater. The tubing is insulated from the tubing head and casing by special insulators. At a point in the well below which paraffin is known to form, contact is made between the tubing and casing to complete the circuit to the surface. Heat is generated in the tubing and rods rather than in the casing because the former have a smaller metal area with a consequent higher resistance. Current is supplied at the surface by a direct-current generator mounted on a truck. Contact is made to the well head by means of removable cables. Data on the application and use of this process are presented, showing that, in the average Panhandle well, paraffin is removed in about 90 minutes' time. Paper presented before spring meeting of Southwestern district of American Petroleum Institute, Division of Production, at Shreveport, La., February 27 and 28, 1941.

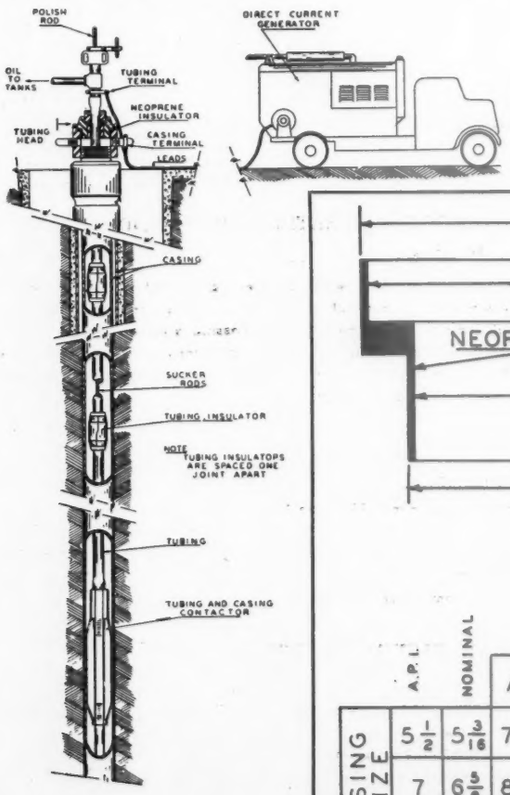
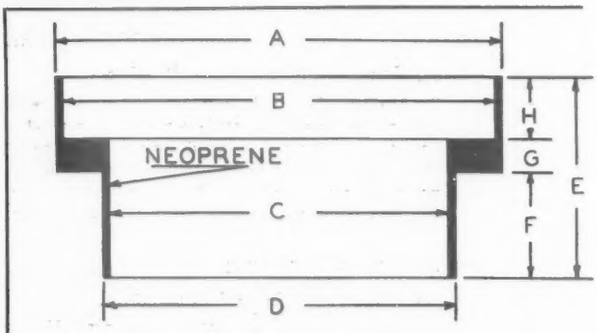


Fig. 1 (left)—Schematic layout of the equipment necessary to remove paraffin by electrical heating. Fig. 2 (below)—Tubing-head insulator



CASING SIZE A.P.I.	NOMINAL	A	B	C	D	E	F	G	H
5½	5 3/16	7 11/16	7 7/16	5 9/16	5 3/16	4¾	2½	¾	1½
7	6⅝	8½	8¼	6 5/16	6 7/16	"	"	"	"
8⅝	8¼	10½	10¼	8 1/16	8 5/16	"	"	"	"

DIMENSIONS

Tubing Insulators

In the early installations the tubing was insulated from the casing by means of rubber sleeves tightly fitted and wired around the tubing coupling. These proved unsatisfactory because the rubber absorbed vapors from the gas, became spongy, and slipped down the tubing to the top of the spring contact frequently leaving the tubing above in contact with the casing. After considerable experimenting to determine an economical substitute for rubber it was decided to use insulators made of hard wood im-

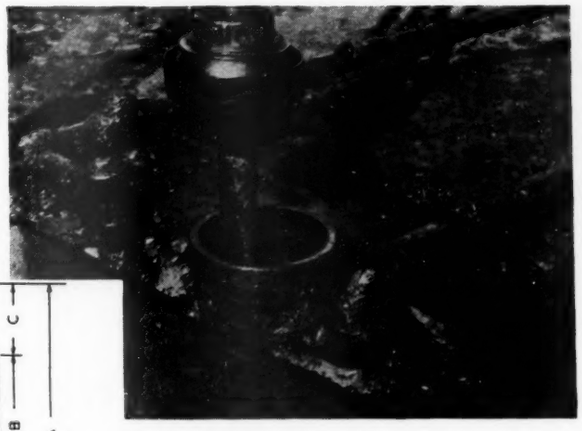
pregnated with linseed oil. (A method of impregnating wood-tubing insulators with linseed oil was given in an appendix which is not included here.) Such impregnation is necessary to prevent absorption of moisture by the wood which would cause a short in the well circuit.

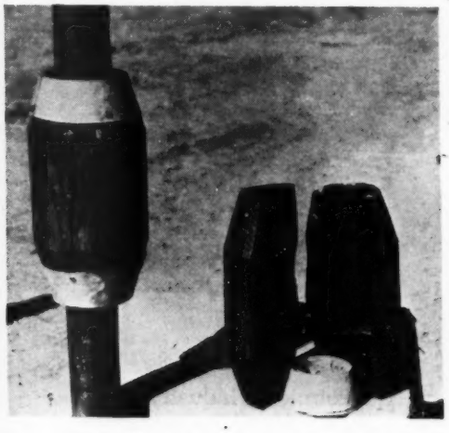
The insulators are bored through the center to fit the various tubing sizes and are then counter-bored with a recess which forms a firmly fitting shoulder around and against the ends of the tubing coupling to prevent upward or downward slipping (see Fig. 4). The ends are tapered to avoid hanging up or breaking as the insulators pass through the tubing head. The insulators are sawed lengthwise through the center in a wavy

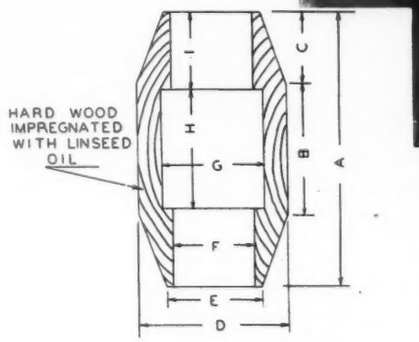
Fig. 3 (right)—Fiber-inserted neoprene tubing-head insulator.

Fig. 4 (below)—Tubing insulator.

Fig. 5 (extreme right)—Tubing insulators







CASING SIZE API	CASING SIZE NOMINAL	A	B	C	D	E	2" UPSET TUBING F	2" UPSET TUBING G	2" UPSET TUBING H	2" UPSET TUBING I	2½" UPSET TUBING F	2½" UPSET TUBING G	2½" UPSET TUBING H	2½" UPSET TUBING I
5½	5 3/16	10 1/4	5	2 5/8	4 5/8	3 1/2	2 5/8	3 1/16	3 5/8	3 5/16	3 1/16	3 11/16	4 5/8	2 13/16
7	6 5/8	10 1/4	5	2 5/8	5 1/2	3 1/2	"	"	"	"	"	"	"	"
8 5/8	8 1/4	10 1/4	5	2 5/8	5 1/2	3 1/2	"	"	"	"	"	"	"	"

pattern and the curved surfaces fit closely together when the two halves are put on the coupling. If either half catches or hangs up when running in the hole the opposite half tends to take part of the stress on the curved bearing surface.

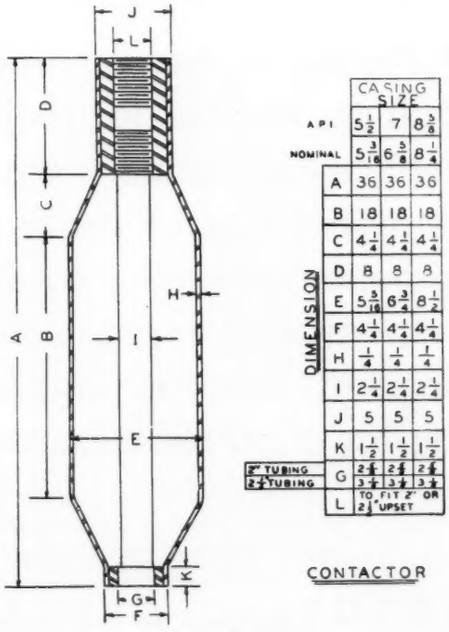
Cone-shaped galvanized metal sleeves are fitted around the tapered ends of the insulator to hold it in place, as shown in Fig. 5. Wood screws are used to attach the sleeves to the insulator.

The Contactor

The contactor consists of four leaf springs welded to a specially made threaded coupling at the top and to a sliding sleeve at the bottom thus providing flexibility and avoiding breakage when lowering the springs through the casing. A dimensional drawing and photograph of the contactor so far developed is shown in Figs. 6 and 7. Outward pressure against the casing is obtained by making the diameter of the contact springs ½ in. larger than the inside diameter of the casing in which they are to fit. The coupling is constructed so as to contain more metal than the cross-sectional area of the springs and tubing combined and thus offers less resistance than the tubing with the result that the springs are at all times cooler than the tubing itself. In the case of 2-in., 4.70-lb. upset tubing the approximate cross-section area is 1.28 sq. in. while the cross-sectional area of the springs is 2.50 sq. in. This provides about twice as much metal for conducting the current through the springs as through the tubing. Contact area of the springs is 160 sq. in. Use of this large cross-sectional and contact area in the springs gives the same effect as an ordinary knife switch. Temperature tests have shown the heating effect is less at the points of contact than at any point within the tubing itself.

Installation

No special equipment or skill is necessary for the installation of the tubing-head insulator, tubing insulators, and contactor. When running the tubing the threads are cleaned with a rotary wire brush and lubricated with a light grade of oil containing some graphite. Care is taken to make the joints up tight. An investigation made to determine the possibility of overheating or fusing between the threads of the tubing and tubing couplings disclosed that the coupling joints and



DIMENSION	CASING SIZE API	CASING SIZE NOMINAL	5½	7	8 5/8
			5 3/16	6 5/8	8 1/4
A			36	36	36
B			18	18	18
C			4 1/4	4 1/4	4 1/4
D			8	8	8
E			5 3/16	6 3/4	8 1/2
F			4 1/4	4 1/4	4 1/4
H			1/4	1/4	1/4
I			2 1/4	2 1/4	2 1/4
J			5	5	5
K			1 1/2	1 1/2	1 1/2
2" TUBING	G		2 5/8	2 5/8	2 5/8
2½" TUBING	G		3 1/4	3 1/4	3 1/4
	L		TO FIT 2" OR 2½" UPSET		

CONTACTOR

Fig. 6—Contactor

threads are from 5° to 15° F. cooler at all times than the tubing. This is reasonable as the threads provide a contact surface of approximately 39 sq. in. on 2-in. upset tubing, and there is a greater thickness of metal in the coupling than in the tubing thus providing for less resistance.

Surface equipment consists of a direct-current generator and leads. The unit now being used has a capacity of 75 kw. at 1,450 r.p.m. It is direct connected to 135-hp. internal-combustion engine. The whole assembly mounted on a 3-ton truck is shown in Fig. 8.

Leads are made of 0000 rubber-insulated copper wire. The leads terminate in a copper bar cut so that they may be conveniently clamped to the casing and tubing (see Fig. 9). Cable terminals are made with 4 or more sq. in. of contact area exposed to tubing and casing. With this amount of contact area per terminal, tests have shown there is no temperature rise at the casing contact and only the normal temperature rise at the tubing contact.

An ammeter, volt meter, voltage-control rheostat, and knife switch are mounted on the main control board. Separately mounted below the control board is a tachometer and an odometer.

Characteristics of Panhandle Paraffin

The accumulation of paraffin in the tubing of pumping wells in the Texas Panhandle generally extends from the top of the well to approximately 1,800 ft. The temperature of the oil when pumped from the wells is about 60° F. In a check of 30 wells near Pampa, the oil temperature at the surface was found to vary not more than 2° F. during the month of July 1940. A temperature traverse of a typical well run through dry tubing to 1,481 ft. showed a maximum temperature of 66°F. at this point. Paraffin is known to start forming at approximately this depth. Consequently, with most electrical heating installations in the Panhandle field the contact is set at about 1,900 ft.

The crude wax or paraffin as deposited in the tubing contain, in addition to the granular particles of the wax, varying amounts of gums, resins, asphaltic material, crude oil, sand, and in some instances, small amounts of water. Reistle[1] gives the analysis of a typical sample from the Texas Panhandle as follows:

Melting point of sample (°F.)	Per cent by weight: Salt-sand water	Oil	Wax	Gum and resin	Asphaltic material
141.2	7	23	54	15	.05

It is evident from this analysis that the chief component of the deposited paraffin is wax. Those materials classed as gums and resins are thought to be part of the little known highly unsaturated constituents present in crude oils and probably consist of oxygen and sulfur compounds. In general paraffin deposits are composed of substances precipitated from the oil as a result of disturbing the solution equilibrium and not as a result of chemical reaction.

Data on the solubility of paraffin wax in oil and the melting point of wax-oil mixtures are

[1]Reistle, C. E., Jr., "Paraffin and Congealing Oil Problems," U. S. Bureau of Mines, Bulletin 348 (1932).

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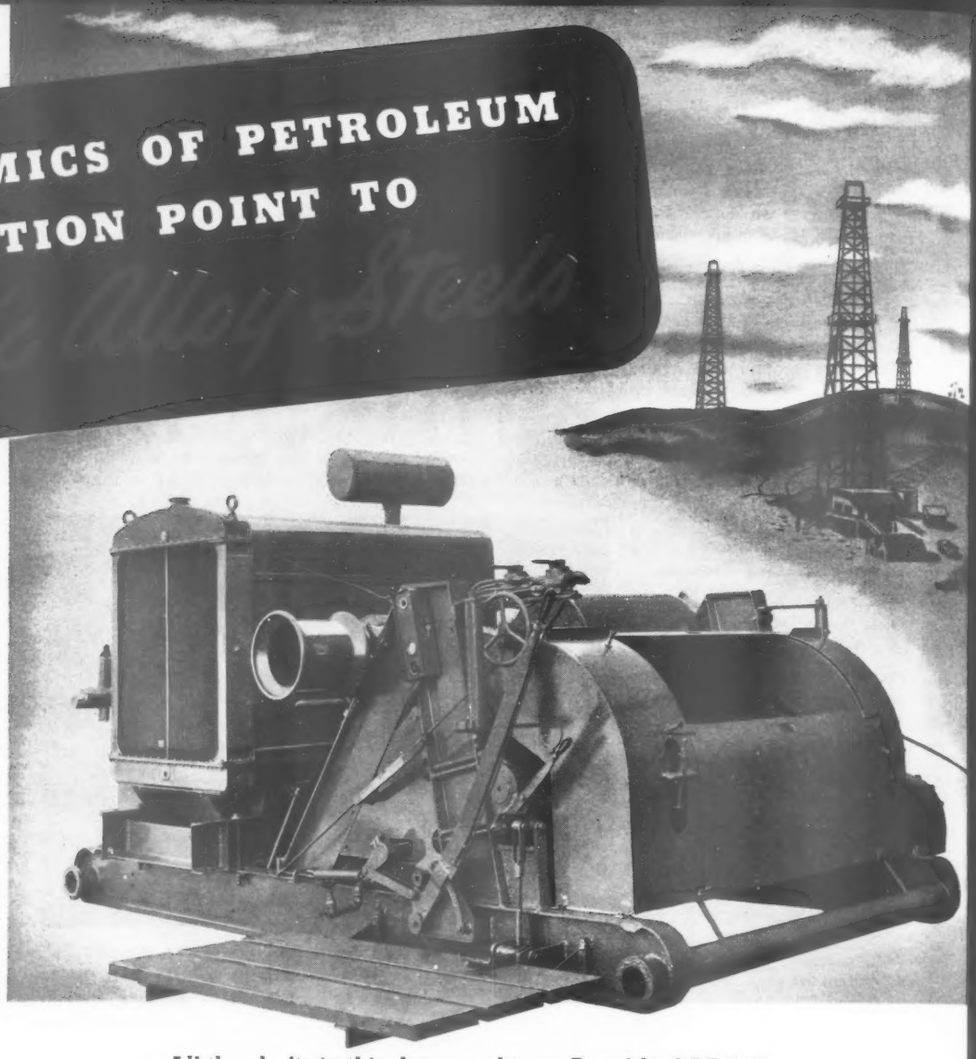

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limited. In general, the solubility of paraffin wax in oil decreases with an increase in its melting point and its molecular weight;[2] therefore, the higher melting-point waxes present in the oil separate first from solution.

To determine the condition of the paraffin-oil mixture between the rods and tubing while the generator is applying heat to the circuit, tests were run on two wells with different sizes of tubing on a lease about 6 miles east of Borger, Tex. In these wells the pump efficiency had decreased to a point where it was necessary to remove the paraffin. The generator truck was attached to the test wells and temperature readings of the mixture of paraffin and oil between the tubing and rods were made every 20 minutes. The results are shown in Fig. 10. It will be noted that when the temperature rises to about 100° F., the rate of heating decreases rapidly. It is probable that increased radiation losses from the tubing are responsible for this condition. It should be remembered the temperature of the metal in the tubing and rods will be in excess of the temperature of the paraffin between them until an equilibrium point is reached.

A sample of the material between the tubing and rods was taken whenever a temperature reading was obtained. These samples when secured were in a fluid state. The melting point and wax content of each sample was determined, as shown in Table 1. These results show that when the wax content of the mass does not exceed 40.6 per cent, a temperature under 100° F. will reduce to a fluid state all of the paraffin between the tubing and rods. However, as the percentage of wax to oil increases, the melting point of the mixture should increase as indicated by the results of Reistle's tests.

TABLE 1—TESTS ON WAX SAMPLES FROM PANHANDLE FIELD, TEXAS

Temperature at which sample was withdrawn from the well	Percentage by weight wax in sample	Melting point of sample, °F. of fluid*
70.5	5.32	60
83.5	6.81	60
90	30.5	77
93	26.0	79
104.2	35.3	90
109	33.6	95
122	40.6	94

*Determined by Ring and Ball method. Well producing under proration 15 bbl. of 40° A.P.I. gravity oil per day.

Samples of weathered Panhandle wax have been secured of which the melting point has been found to be as high as 165° F. by the Ring and Ball method. This fact has encouraged the assumption that the paraffin and oil mixture between the tubing and the rods must be heated to this temperature before the paraffin will melt. The situation is analogous to sugar and water. The melting point of pure sugar is relatively high. However, sugar mixed with a little water and heated will go into solution at a low temperature. The same phenomenon is true of a paraffin and oil mixture. By raising the temperature of the mixture, the paraffin returns to solution.

To illustrate the effect of weathering on the melting point of wax, a sample was secured from the offset well to the one on which the tests herein described were run. This sample was secured while a stripping job was in progress and was nearly free of oil. Its melting point was found to be 129° F. This same wax after being steamed from the tubing and weathered for 2 weeks had a melting point of 153° F. This effect of evaporation losses on the melting point of the paraffin is a point frequently overlooked.

In some cases, paraffin obtained from a well after electric heating contains small granular particles of sufficient number to cause it to act as a viscous fluid that will pile up in the burning pit under the outlet of the flow line. However, its appearance differs from that removed by chemicals as it is not plastic. The present equipment in use in the Panhandle field is capable of generating enough heat to put all of the paraffin completely into solution as is shown in Fig. 11.

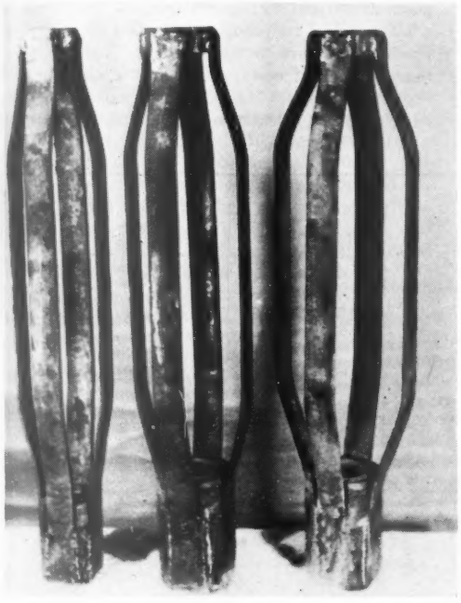
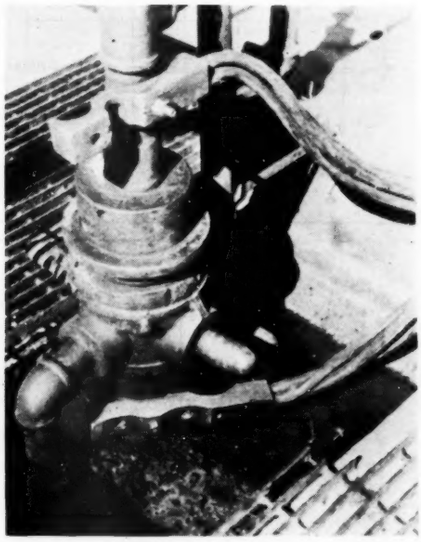


Fig. 7 (left)—5½, 7 and 8⅝-in. contactors. Fig. 8 (left, below)—135-hp. engine at 1,450 r.p.m. directly connected to 75-kw. shunt-wound d.c. high-amperage and low-voltage generator. Fig. 9 (below)—Positive and negative terminals to tubing and casing



Characteristics of Well Circuits

The total amount of heat supplied to the well circuit will follow Joule's law:

$$\text{Heating energy in B.t.u.'s} = \frac{I^2Rt}{1{,}055}$$

where:

I = current in amperes
R = circuit resistance in ohms
t = time in seconds.

To calculate this value the circuit resistance must be found experimentally as the resistance set up by the tubing, coupling, and rods could be most any value depending upon the amount of corrosion, condition of the threads, and area in contact. This has been done on numerous wells and the results shown in Fig. 12. The results obtained have been remarkably consistent when the number of variables influencing the resistance are considered. In a group of nine wells equipped with 2-in., 4.70-lb. upset tubing, ⅝-in. rods, and 7-in., 20-lb. casing with the contact set at 1,920 ft., the maximum variation in circuit resistance was found to be 7½ per cent. Similarly, a group of seven wells using 2½-in., 6.50-lb. upset tubing, ¾-in. sucker rods, and 7-in., 20-lb. casing with the contact set at 1,920 ft. had a maximum variation in circuit resistance of 10.1 per cent.

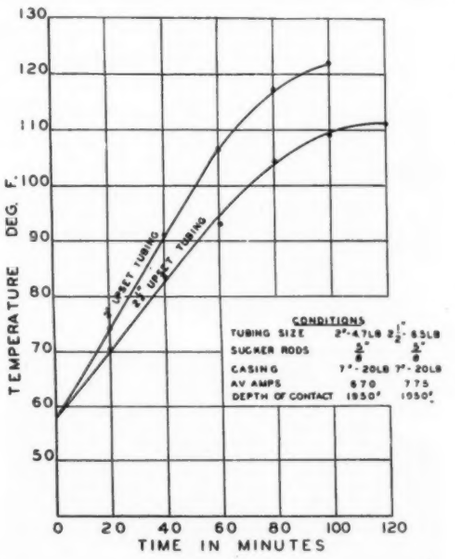


Fig. 10

The circuit resistance, theoretically, should be a linear function of depth providing the resistivities of the formations through which the casing passes are identical along the path of the current. However, it is known from electrical surveys that the resistivities of different formations vary within wide limits depending chiefly upon the porosity and the amounts and composition of water present.

To check this influence on the circuit resistance in Panhandle wells two wells were selected for test. In well "A" the water string consisted of 600 ft. of 10¾-in., 32-lb. casing with an oil string of 7-in., 20-lb. casing landed at 2,990 ft. Two-inch, 4.70-lb. upset tubing was run dry into the hole

[2]Sullivan, F. W., Jr., and McGill, W. J., "Solubility of Paraffin Wax in Oil," Ind. and Eng. Chem., Vol. 9, 1927, pp. 1,042-45.

and the circuit resistance read every seventh joint or approximately every 218 ft. These readings were made with the sucker rods out of the hole. The results of this test, shown in Fig. 13, indicate that in this case the circuit resistance is a linear function of the depth of contact. In this experiment the value of the circuit resistance remained practically constant at 75.5 microhms* per foot of depth, the maximum variation of the test results being less than 3 per cent.

In well "*B*" the casing consisted of a 7-in., 20-lb. string landed at 2,992 ft. The 2½-in., 6.50-lb. upset tubing was run dry and the circuit resistance checked every seventh joint without the rods as in the previous experiment. As shown on the graph of the two experiments, in this case the circuit resistance did not prove to be linear function of the depth of contact. It will be noted that at a depth of contact of 215 ft. and 436 ft. the circuit resistance in both wells is in very close agreement. Obviously this is not possible under ideal conditions.

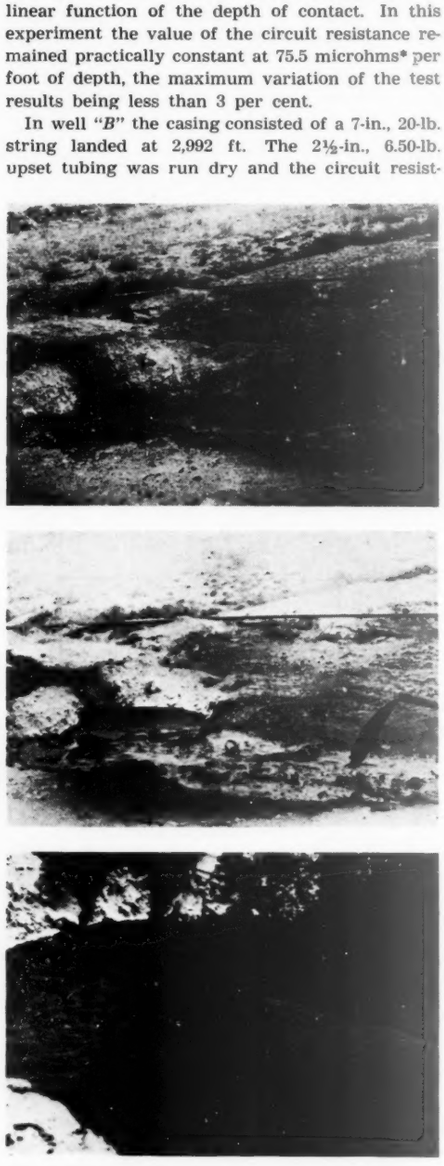


Fig. 11—Top: Empty burning pit before pumping paraffin from well. Center: Well pumping paraffin into pit after heating. Bottom: Pit and melted paraffin

It is probable that the decrease in resistance with depth in well "*B*" is due to a decrease in the resistivity of the formation at depth thus permitting more current to be shunted through the ground. Further, it is probable that in the case of well "*A*" the circuit resistance has been lowered near the surface because of contact between the 7-in. oil string and the 10¾-in. surface string providing a greater metal area for the current to pass through. If the 10¾-in. surface string had been absent in well "*A*", the two curves would probably have met at zero depth and circuit resistance for well "*A*" would not have been found to be a linear function of depth.

The addition of ⅝-in. sucker rods to well "*A*" with the contact set at 2,092 ft. caused the circuit resistance to drop 18 per cent. In well "*B*" the addition of ¾-in. sucker rods with the contact set at 1,977 ft. caused a drop of 14.7 per cent in the circuit resistance.

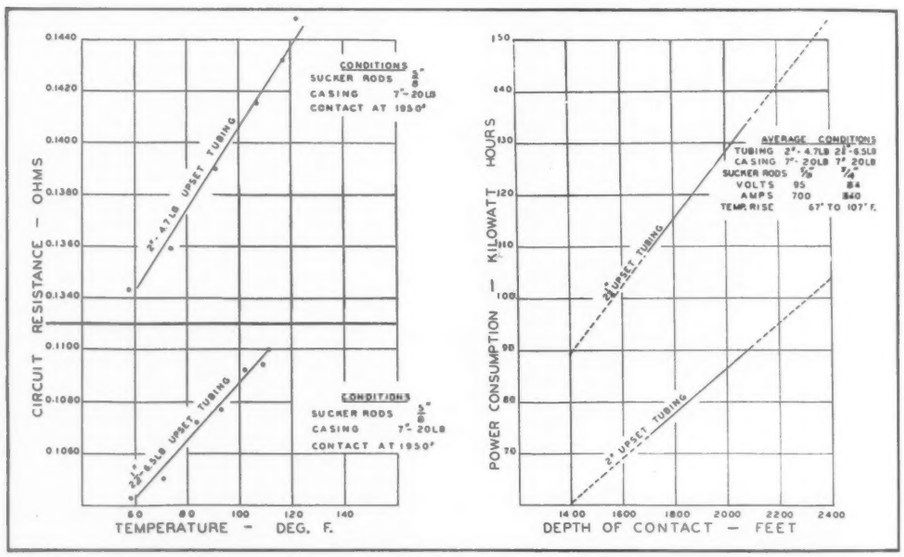
The change in circuit resistance with the temperature of the fluid between the rods and tubing is shown in Fig. 14. As was to be expected, this proved to be a linear function. This should not be confused with temperature of the metal in the rods and tubing as the temperature of the latter will be somewhat higher.

Once the circuit resistance of a well is known, shorts may be detected before connecting the generator by checking the circuit resistance with a standard commercial chamber. Generally it has been possible from this check to calculate the depth at which the short occurs. This procedure is followed carefully to eliminate any possibility of fusing between the tubing and casing. While the operator can note a short by starting the generator and checking the volt meter and ammeter, the additional check is provided for maximum safety.

Data available on the total power consumption required for different sizes of tubing and depths of contact are, as yet, meager. For the depth interval between 1,000 and 2,000 ft., however, the data presented in Fig. 15 are in accord with experience in the Panhandle field. The data for the preparation of this graph have been conservatively chosen from actual field records and the values read from it will consistently err on the high side. This will be more true of the 2½-in. tubing than the 2-in. tubing for the data on the former are more complete. These figures, of course, will be altered for other fields in which different types and kinds of wax exist under conditions not similar to those found in the Texas Panhandle.

Operating Data

The time required for paraffin removal from a well in which the rods are frozen tight with paraffin but in which no mechanical failure has occurred, before and after electrical heating equipment has been installed, is shown in Table 2. In general, 80 per cent of the cost of this type of a pulling and stripping job can be saved by removing the paraffin electrically. This figure is based on direct costs chargeable to the job and does not include indirect costs such as firing boilers, water, pickup service, or labor used in treating the well.



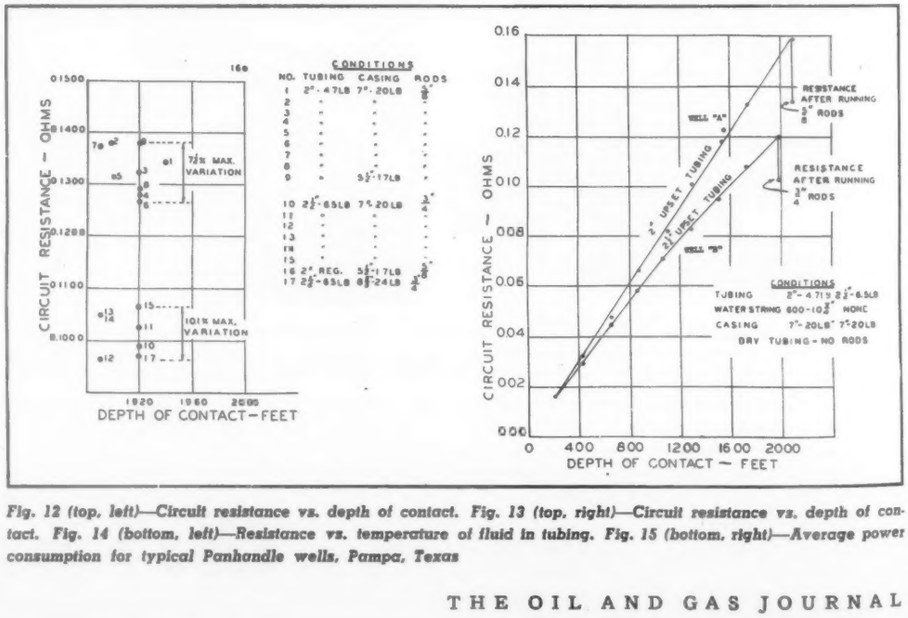


Fig. 12 (top, left)—Circuit resistance vs. depth of contact. Fig. 13 (top, right)—Circuit resistance vs. depth of contact. Fig. 14 (bottom, left)—Resistance vs. temperature of fluid in tubing. Fig. 15 (bottom, right)—Average power consumption for typical Panhandle wells, Pampa, Texas

*Includes both tubing and casing.

A case history of a typical well follows: The rods stuck in paraffin after the well had been pumped 80 days. The generator was connected and a current of 800 amp. at 82 volts was applied for 1 hour and 20 minutes. The temperature at the well head was raised from 68° to 108° F. Immediately after, the cables were disconnected and the pumping unit started with the rods dropping freely. About 6 bbl. of paraffin were pumped into the pit. The first was soft and thick enough to pile up under the flow pipe while the remainder was a viscous liquid. Treatment data on 17 typical wells are given in Table 3.

A comprehensive study has been made of the time and cost savings made on wells which have failed mechanically before and after equipping for electrical heating. The results, given in Table 4, covered the following types of pulling jobs.

1. The rods and tubing were stripped from a stuck well, the tubing run without steaming, and the rods run in without difficulty for a screw-on job.

2. The rods and tubing were stripped out, the tubing rerun without having been steamed, and an insert pump run and seated in the barrel through 45 joints of tubing that had been plugged with plastic paraffin.

3. A socket was run through the tubing in a badly paraffined well, a broken rod picked up, the rod replaced, and the well put back on production without pulling the tubing.

4. The working valve was pulled out and an insert pump run in its place without pulling and steaming the tubing.

Accomplishments such as those outlined above are responsible for the average saving in cost per job of 50 per cent as shown in the last column of Table 4. (Further operating data were given in an appendix which is not included here.)

TABLE 2—TIME REQUIRED FOR PARAFFIN REMOVAL FROM WELL BEFORE AND AFTER EQUIPPING WELL FOR ELECTRICAL TREATMENT—PANHANDLE FIELD, TEXAS

(Rods frozen tight with paraffin. No mechanical failure)

Well—	Time required for pulling jobs†			Time required to clean well of paraffin by electrical method		Costs saved by using electrical method in place of conventional method‡ (per cent)
	Pulling mach. time (hours)	Labor (man-hours)	Truck time (hours)	Generator (truck-hours)	Operator (man-hours)	
Haile 1*	7.0	24.0	4.0	1.33	1.33	78.3
Haile 3	27.0	90.0	4.0	1.25	1.25	88.1
Haile 5	27.0	120.0	4.0	1.50	1.50	93.0
Haile 10	11.0	54.0	4.0	1.25	1.25	84.0
Watkins 12	6.0	16.0	4.0	1.33	1.33	50.6

*All Haile wells are on the same 160-acre lease. †Paraffin removed by steaming at boiler house. ‡Includes only tangible costs (based on normal chargeoffs for Panhandle field). Pulling machine time includes operator. Truck time includes operator.

TABLE 3—TREATMENT DATA

Well—	Casing (in.)	Tubing (in.)	Sucker rods (in.)	Depth of contact (ft.)	Volts	Amp.	Time	Temp. rise °F.
Watkins 26	7	2½ up	¾	1,620	84	905	1 hr.	67-109
Watkins 25	7	2½ up	⅞	1,890	85	775	2 hr.	68-109
Watkins 6	7	2½ up	¾	1,890	81	825	1 hr. 30 min.	40
Watkins 27	7	2½ up	⅞	1,890	84	800	1 hr. 20 min.	42
Watkins 3	7	2½ up	¾	1,920	82	800	1 hr. 30 min.	40
Henry 2	7	2½ up	¾	1,920	82	825	1 hr. 30 min.	68-108
Haile 1	7	2½ up	¾	1,920	81	825	2 hr.	39
Sullivan 3	7	2½ reg.	¾	1,920	86	910	1 hr. 54 min.	64-104
Starnes 2	7	2 up	⅞	1,800	91	695	1 hr. 30 min.	70-110
Watkins 23	7	2 up	⅞	1,890	95	725	2 hr.	68-107
Watkins 10	7	2 up	⅞	1,920	93	690	1 hr. 20 min.	67-107
Watkins 22	7	2 up	⅞	1,920	95	700	1 hr. 15 min.	42
Watkins 19	7	2 up	⅞	1,920	96	700	1 hr. 20 min.	40
Pond 5	7	2 up	⅞	1,920	95	675	1 hr. 15 min.	67-107
Pond 7	7	2 up	⅞	1,890	95	690	1 hr. 30 min.	67-107
Pond 8	5½	2 up	⅞	1,920	96	695	1 hr. 15 min.	67-108
Haile 6	7	2 up	⅞	1,920	95	700	1 hr. 15 min.	68-108
Haile 10	7	2 up	⅞	1,890	96	675	1 hr. 10 min.	68-108
Johnson 1	5 7/16	2 up	⅞	2,000	97	660	1 hr. 10 min.	63-107

Electrolytic Action of Current on Tubing and Casing

Since there are no high-resistance points in the well circuit no action by electrolysis is considered possible. As previously stated, the tubing couples and the spring contact between the tubing and casing constitute points of low resistance. All metals in the well which come in contact are of the same composition.

Oil itself offers no problem in so far as electrolysis is concerned because of its inability to conduct electric current. However, the limited data available indicate that electrolytic action can occur when oil is emulsified with approximately 12 per cent or more of salt water of normal oil-field salinity outside the tubing and between the tubing and casing. Inside the tubing any amount of salt water would have no effect as the tubing constitutes only one side of the circuit. In general the fluid level of most wells is below the contact between the casing and tubing where no electrolytic action can take place. Further, emulsions are rarely found between the casing and tubing.

Reversing the polarity of the circuit several times during treatment will destroy any possibility of electrolysis or effect due to the magnetism created by a current in one direction. In the treatment of wells this procedure is followed.

Influence of Tubing Insulators and Contactor on Finding the Fluid Level by the Sonic-Reflection Method

With the threat of proration allowables based on bottom-hole pressures, the effect of the tubing insulators and contactors on obtaining the fluid level by the sonic-reflection method assumes importance. A well with zero casing-head pressure, and thus having the most difficult conditions for recording sonic reflection, was selected for test. The fluid level was known to be below the electrical contact leaving every exposed joint with an insulator to be recorded. Under these severe conditions the sonic-reflection recordings were distinct and readily interpreted.

Conclusions

1. By electrical heating with a 70-kw. d.c. generator, the paraffin in the average Texas Panhandle well can be returned to the fluid state in not more than 90 minutes' treating time.

2. The cost of installing electrical heating equipment in a well will not, in most cases, exceed one-half the cost of a normal pulling and stripping job.

3. When a well is frozen tight with paraffin but no mechanical failure has occurred, approximately 80 per cent of the cost of pulling and stripping the paraffin from the tubing and rods can be saved by melting the paraffin electrically and pumping it out of the well.

4. When a well has suffered mechanical failure and substantial amounts of paraffin are between the rods and tubing, approximately 50 per cent of the pulling cost can be saved by melting the paraffin by electrical heating before pulling the well.

5. There are no occupational or well hazards of an unusual nature connected with the application of this process.

6. Fusing of the tubing to the casing or of the contactor to the casing is not possible under the methods of treatment now being used.

7. Fusing of the tubing couplings is not to be feared because the couplings constitute points of low resistance.

8. In general in the Texas Panhandle it is not necessary to heat the paraffin in the tubing to a temperature in excess of 100° F. to be able to pump it from the well.

9. The tubing insulators and the contactor offer no obstruction to obtaining the fluid level of the well by the sonic-reflection method.

TABLE 4—TIME REQUIRED FOR PULLING WELL DUE TO MECHANICAL FAILURE BEFORE AND AFTER EQUIPPING WELL FOR ELECTRICAL TREATMENT*

Well—	Ordinary time required for pulling rods and tubing due to mechanical failure (rod parted, pump failures, etc.)		Extra time required for pulling job due to paraffin			Time required to clean well of paraffin by electrical method		Per cent of total cost saved by using electrical method of removing paraffin before pulling well†
	Pulling-machine time (hours)	Labor (man-hours)	Pulling-machine time (hours)	Labor (man-hours)	Truck time (hours)	Generator truck (hours)	Operator (man-hours)	
Haile 1	12	32	7	24	4	1.00	1.00	33.8
Haile 14	12	32	2	8	4	1.25	1.25	8.4
Haile 15	12	32	3	12	4	1.25	1.25	17.5
Haile 2	12	32	12	48	4	1.50	1.50	47.1
Watkins 3	6	16	14	48	0	1.25	1.25	62.3
Watkins 9	12	32	5	48	4	1.00	1.00	49.8
Haile 4	6	16	15	51	4	1.50	1.50	64.6
Haile 11	6	16	9	36	4	1.25	1.25	55.1
Henry 3	6	16	9	48	4	1.50	1.50	54.2
Haile 1	6	16	12	48	4	1.33	1.33	60.5
Haile 6	12	16	1	4	4	0.45	0.45	5.0
Watkins 11	12	20	9	36	4	1.50	1.50	37.2
Watkins 7	12	48	7	24	4	1.25	1.25	31.6
Pond 2	12	20	3	12	0	1.25	1.25	7.3
Haile 13	12	48	15	60	4	1.50	1.50	50.5
Haile 2	14	48	13	60	4	1.50	1.50	45.7
Haile 14	14	48	7	48	4	1.25	1.25	35.5

*Average well pulled was between 3,000 and 3,200 ft. deep with 2 or 2½-in. upset tubing hung 30 ft. off bottom; ⅝-in. and ¾-in. sucker rods used. Pulling-machine time includes operator. Truck time includes operator. †Based on normal chargeoffs for Panhandle field.

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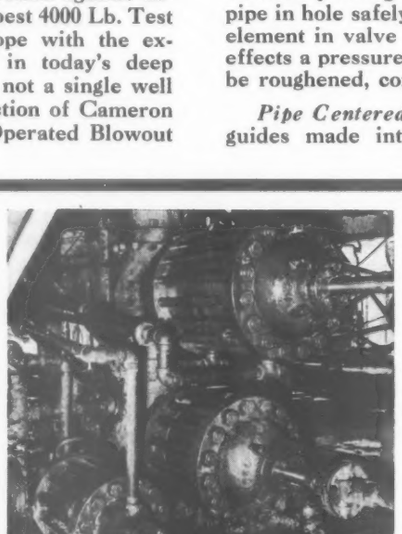

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Practical Economics Of Cycling

By B. B. BOATRIGHT and P. C. DIXON
Foran, Boatright & Dixon, Houston, Tex.

A.P.I. SUMMARY

The purpose of this paper is to present in practical form a discussion of factors which, in the ultimate analysis, determine the probable degree of success and profit to be derived from a cycling enterprise. In order to coordinate the presentation of many divergent subjects, it is written as though directed to persons who seek a pattern about which they may intelligently attack the problem of inspecting and possibly developing a cycling project.

The paper was presented before the spring meeting of the Southwestern district of the American Petroleum Institute, Division of Production, February 27-28, at Shreveport, La.

A GREAT deal has been written concerning the fundamental laws governing the phenomena of retrograde condensation, the design and operation of cycling plants, and other technical phases of cycling projects, but relatively little attention has been paid the more broad and fundamental business aspects that must be considered by the average operator.

Cycling operations in condensate-bearing gas fields are assuming an important role in the oil industry. Thirty-one plants, with a combined processing capacity of some 1,250,000,000 cu. ft. of gas per day, are now recovering about 25,000 bbl. of condensate daily. Approximately three times as much gas was processed by cycling plants in 1940 as in 1939; contemplated plants for 1941 may bring the total amount of gas being processed to twice the 1940 figure. Obviously, there are definite reasons for this rapid increase.

The art of cycling has progressed well beyond the experimental stage and its development has provided a means of recovering condensate reserves that would otherwise be irretrievably lost and of conserving dry gas for future use. Cycling represents a decided advance in production technique; the combined effects of pressure maintenance and gas drive in a properly designed cycling project result in high recovery efficiency without physical waste.

Cycling projects are more subject to self-enforced economic proration than to governmental proration. Distillate wells can, in many cases, be called little more than "dry holes," presuming the usual lack of gas market. A wildcat well, finding distillate but no oil shows, cannot be called dry and yet the distillate cannot be produced by conventional separator methods because of wasteful gas-liquid ratios. In order to protect the well investment and to hold the lease, it is common for the operator to set pipe and thus bring to being another of those enigmas, a distillate well. Were such a discovery an oil well, 20-acre offsets would be justified and have almost certain possibilities of success; being a distillate well, this offset distance must be materially increased, with attendant uncertainty of securing any kind of production.

In selecting the offset distance, the operator may presume that there will be a "ring of oil," that elusive and usually unprofitable strip sometimes found between the water and the gas, or he may presume that the entire structure is gas, in which latter case an offset well on 180 acre spacing might have no value if the final method of production is by cycling. If the distillate content and the well pressure are average, the total condensate reserve in the reservoir in which this hypothetical well is completed will be about 50 bbl. per acre-ft. The economic returns that may be expected from prospecting for reserves as marginal as these are certainly not great and yet certain interests are now petitioning for the application of state proration to these projects; certainly physical waste cannot be shown. A comparison of the economic return per dollar invested, production per acre per day, or investment per barrel of distillate in place in the reservoir for comparable oil and condensate pools will show that arbitrary proration is not justified if it would curtail production from the average present-day plant.

In spite of the fact that about 150 gas-distillate fields are known, the development of cycling projects will not be unduly rapid. Relatively few projects are economically feasible and, even under ideal conditions, from 1 to 2 years usually elapse before a given project can be completed. The reasons for this lapse of time become apparent when the various steps which must be taken are analyzed.

Preliminary Investigation

A preliminary investigation is always advisable before seriously considering any cycling project, as very often this casual survey will reveal conditions that preclude a reasonable chance of success. This survey need not be exhaustive but should include a brief investigation of available data to determine (*a*) that the distillate content of the gas is sufficient to justify treatment; (*b*) that there is a possibility of unitizing sufficient acreage to assure an adequate gas reserve; (*c*) that contractual requirements are not prohibitive or, in the event they are prohibitive, that they can be modified; (*d*) that well potentials are sufficiently high so that an excessive number of wells will not be needed; and (*e*) that subsurface conditions are favorable for cycling.

Detailed Investigation

In the event that a cycling project appears desirable after preliminary examination, a thorough evaluation is in order. It is obviously impossible to recite all of the variations incidental to each step of the analysis, but an attempt will be made to present the general procedure involved and to identify the factors that may govern profitable operation.

Distillate content and characteristics.

The exact nature of the reservoir gas must be determined by calculated recombination of surface samples of gas and liquid. It is advantageous to conduct the sampling operation at a pressure that yields a maximum liquid recovery, for in addition to the fractional analysis of the liquid for determination of its component parts, this same liquid should be separated into its various commercial products. Some distillates yield premium-grade gasolines and diesel fuels, while others are known to yield a gasoline totally unfit for market in even the poorest grade or price range. Most of the cost items of condensate recovery are basic and not dependent upon the type of products manufactured so that, for example, a product that markets for 3½ cents a gallon may produce a 50 per cent greater net plant profit than a product that markets for 3 cents a gallon. It follows then that the nature of the product to be produced by the plant should be known.

Sampling of the well products must be conducted with a maximum degree of accuracy, for all economic considerations will be based upon the computed recovery shown from this test. The probable degree of accuracy may bear a relationship to the time of test, or to the degree of refinement of gas and liquid measurement, but in any event, the limits of accuracy are known by the person conducting such a test and these limits should be carried through to the final balance sheet of proposed operations.

Reserves.

Total reserves in place in the reservoir must be calculated, and this is done in the conventional manner. Deviation due to supercompressibility and surface shrinkage due to condensation of liquids should be determined and the proper correction factors applied if these factors are in excess of the limits of accuracy of the metering or the analyses from which the factors must be calculated. Average sand thickness is derived from the customary sources, but at this point a new element may enter some calculations. If the reserve calculations were being made to determine total gas reserves in place and available for pipe-line sale, the entire sand section containing gas is usually weighed for average porosity and connate water to determine the void space containing gas.

If this method of reserve calculation is used, then the factor of cycling efficiency later applied in order to obtain recoverable reserves should be correspondingly lowered, depending upon the degree of shaling or lensing indicated by well records and depending also upon the amounts of shale present in the cores to reduce the average vertical permeability and thus prevent free gas movement in a vertical direction. On the other hand, the well logs may be carefully studied to determine the average sand thickness through which effective circulation appears possible. This latter thickness will be less than that formerly described and might be called effective sand thickness. In applying this effective sand thickness to the estimate of total recoverable reserves, the factor of cycling efficiency may be relatively high. In any event, however, the results obtained by the two methods should give comparable figures of total recoverable reserves.

If structure and sands are defined with reasonable geologic exactness, a calculation of total gas-distillate reserves is more exact, on a barrel basis, than similar calculations of dark-oil reserves; further, although differences of opinion exist as to the efficiency of gas circulation or displacement within the possible limits of 40 to 70 per cent efficiency, the calculation of ultimate recovery is at least as exact, on a barrel basis, as similar calculations of dark-oil recovery and economically more exact because the factor of lifting cost is omitted and the factor of discount is minimized.

Development and drainage pattern.

From the strictly theoretical standpoint, it is

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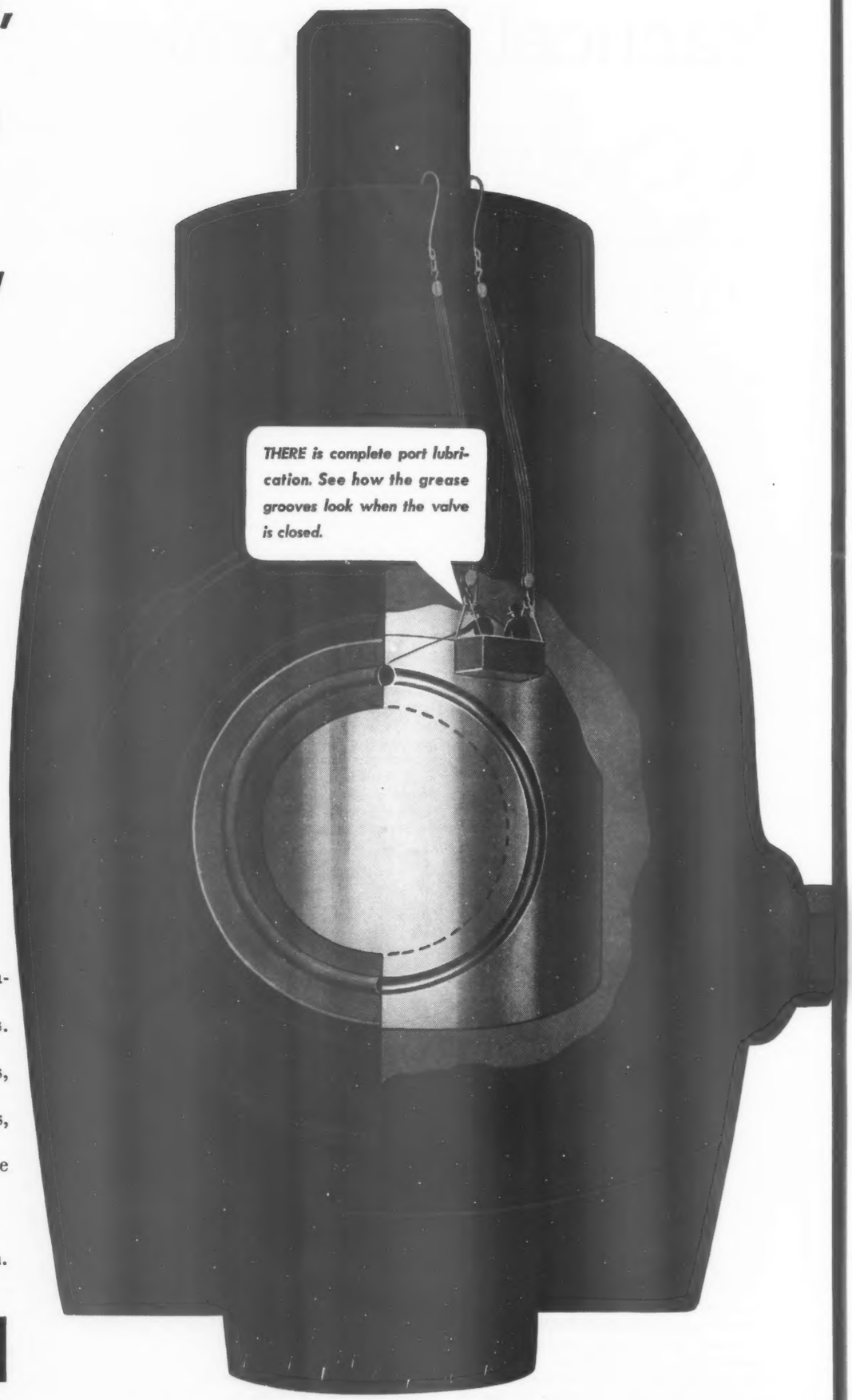

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possible to completely develop a hypothetical unitized field of about 4,000 acres and to cycle and recover its distillate reserve in a hypothetical 90,000,000-cu. ft. plant with a maximum of approximately 10 wells. Such fields will probably never exist in reality because in the first place this number or more wells will probably be drilled to define the productive structure. This latter situation being the usual case, the operator considering a cycling project is confronted with the problem of designing a drainage pattern to make the best use of presently drilled wells. Drilling obligations must ordinarily be suspended by agreement in the unitization contract and the final development generally produces a drainage pattern that represents a compromise between that which is economically practical and that which is theoretically efficient.

Wells used for cycling service may cost more than ordinary wells due to casing and coring costs. Casing should be about 7 in. in size if workovers to other sands are expected or if flow rates will be high. Every potentially productive sand should be completely cored and every core recovered should be subjected to tests for the determination of connate water, porosity, and horizontal and vertical permeability.

Plant type and size.

Selection of the type of plant best suited for maximum profit from cycling operations may be dependent upon one or more of the following several factors: (1) Anticipated life of operations, (2) content of the gas, (3) type of final products desired, (4) flowing well-head pressure.

The anticipated life of operations should make a material difference in the quality and overall permanent nature of plant construction, assuming, of course, that in no event there can be any sacrifice in the safety features or the safety factors employed.

It has been found that a condensation-type plant, either with or without mechanical refrigeration, is not ordinarily best suited to the needs of all particular situations; likewise, it has been found that the oil-absorption plant does not in all cases meet the requirements of returning a maximum profit with reasonable flexibility of operations over the life of the project. Distillates have been found to vary widely in their general physical makeup. In some cases the distillate gas is composed primarily of relatively light hydrocarbons, a large proportion of which might ordinarily be constituents of natural gasoline. In other cases the distillate gases have been found to contain extremely heavy hydrocarbons.

A fairly definite relationship exists between the content of the gas, for any given reservoir temperature and pressure, and the weight of the hydrocarbons contained in the gas phase and, as a rule, the heavier the condensate material, the leaner the gas. These heavy liquids are susceptible to efficient and economic recovery by ordinary condensation and regenerative cooling, providing the well-head flowing pressure is sufficiently high. In some fields, then, it may not be possible to justify the installation of a more ornate type of plant, such as an oil-absorption plant, if the cooling available through the choke is capable of producing recoveries that yield the greatest net income. On the other hand, recovery from a light distillate gas, if made in a condensate-type plant, must be with the assistance of expensive mechanical refrigeration in order to avoid high losses in the form of plant tail-gas content.

It has been found that overall economic conditions upon which the operator must figure his profit are rarely, if ever, the same in any two fields. In all probability some form of an oil-absorption plant will be, in most cases, the most profitable type of installation, but it would not be prudent to overlook other possibilities when preparing a financial analysis of proper operations.

Selection of plant size is based largely upon the relative economic returns from a range of sizes varying between a large plant with its correspondingly short life and a small plant with an expectation of operating life that approaches the useful economic life of the equipment installed therein. From a practical standpoint, the anticipated life of operations should not be less than 5 years, and with a greater life than 5 years the size selected should be one that makes proper and full use of all installed facilities.

Costs increase in some types of plant in multiples of from 30,000,000 to 60,000,000-cu. ft. capacities. In one type of plant, for example, it costs relatively little more to construct a 120,000,000-cu. ft. plant than it does a 100,000,000-cu. ft. plant because the equipment items which represent a major portion of the investment, including the standby or spare units, are not fully utilized by the 100,000,000-cu. ft. capacity. A more common-size plant will probably be one of approximately 60,000,000 cu. ft., and in this range the 60,000,000-cu. ft. plant may cost very little more than a 50,000,000-cu. ft. plant. Use of the proper-size multiples should be considered in connection with the analysis of the cycling project. In a completely unitized field, the optimum-size plant will return the greatest profit; in a competitive field, plant size is largely dependent upon equitable exhaustion of reserves.

Unitization.

The idea of establishing cycling operations may originate with one or more, or with the entire group, of the operators in the field or with an outside interest. Depending upon the source of the idea, the course of events leading to agreements between the plant operator and each lease operator will undoubtedly be different in each project. One of the greatest problems to be solved, if the operators themselves undertake the venture from the original stages, is that of establishing some group of representative individuals with power to act for their respective companies. The ramifications of developments of the original idea are rather astounding and unless the committee, or person, or company that acts for the entire group of operators is delegated full authority to make lease-unitization commitments, it has been found that the process of reaching an agreement among the operators may become a hopeless venture.

Some operators will have completed more wells than others and with propriety may feel that they are entitled to receive a return partially dependent upon the size of their present investment as compared with the size of other operators' investments. In a large measure, the wells which have been so completed have helped to prove the structure and establish the necessity for the cycling project, but, on the other hand, it is possible that many of these completed wells cannot be profitably employed in cycling operations.

One problem that may arise due to this situation will be to compensate some operators for wells already drilled. The amount of compensation requested by these operators with presently developed properties may not be acceptable to other operators with completely undeveloped acreage, and as a result it is not uncommon for the situation to lead to unitization of reserves, with consequent unit operations of a plant, but with each individual operator obligated to develop his own leases on some predetermined drilling density program. In some cases where pure distillate production is obtained it is fallacious to establish arbitrary drilling blocks and to drill, for example, a geometric pattern of wells, one in each 160 or 320-acre block. Some of the wells drilled on such a geometric pattern will not add to the efficiency of reservoir recovery and their cost cannot be reasonably justified.

Another matter in which the operators will be materially interested will be the methods of allocation of plant production to the various leases. In fields in which development is advanced, it may be easy to agree upon the reservoir reserves underlying each of the leases controlled by the various operators. In such an event, allocation is most readily made upon the basis of reserves in place. If, due largely to sparse development, material differences exist in independent calculations of total reserves underlying the various leases, then the most feasible method of allocation will undoubtedly be on a straight acreage basis.

There are many reasons to justify the allocation of production on a straight acreage basis and such allocation is sensibly made and is advantageous in many respects. It is reasonable to expect that some operators may not be allocated what appears to them to be their full interest in the recoverable production, while to them others may appear to receive more than their full interest. The difference between the full interest that might theoretically seem to be due and that which is offered may appear to be large and consequently well worth trying to establish. On the other hand, if cycling operations are not undertaken, the difference between the actual interest proposed in the cycling project and the actual recovery anticipated to be made from the reservoir by other production means will cause to appear insignificant any relatively small differences that might seem to exist under the unitization plan.

In some cases it is not possible to unitize the entire field at one time, but it may be possible to organize a sufficient number of units or a single unit of sufficient size to justify commencing operations. In this event, it is customary to add other units or additional acreage from time to time, providing, however, that such provision has been made in the original unitization agreement with the first unit group. If a fair and equitable distribution of the recoverable condensate is made, the originally recalcitrant operators are very apt to modify their opinions and desire admission to the unit operations in preference to either constructing a plant of their own, or of seeing their reserves swept away, or of using their acreage in any type of competitive operation.

During and after assembly of the original cycling unit, it behooves all of the field operators to very carefully consider any acts or agreements which do not make provision for an equitable outlook for every lease and which thereby invite competition. Properly conducted, competitive operations may neither add to nor detract from the ultimate recovery of lease reserves or their economic value; but, unfortunately, strategic acreage may make reserve recovery proportional only to plant capacity. Certain relief from this situation is obvious by application of our knowledge of dry-gas movement in the formation. When viewed from the economic perspective, the obvious and most sensible solution to probable competitive operation is cooperative, amicable, and sensibly planned joint activities. Leases which are strategically located outside the operating units are potential competitors regardless of size or the probable economics of a cycling installation thereon. Some cycling projects have been commenced without sufficient economic life in their proved reserves to return their investment costs.

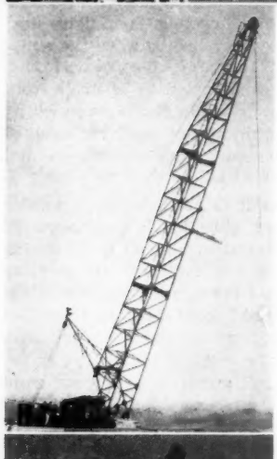
Royalty interests are ordinarily thought to be difficult of unitization, but such may not be the case. If the content of the distillate gas is suf-

(Continued on Page 54)

FRANKS MFG. CORP. WELL SERVICING AND DRILLING UNITS

Portable Rotary "Slim-Hole" E

Franks SA type portable rotary skid drilling rig showing how derrick is raised in one piece.

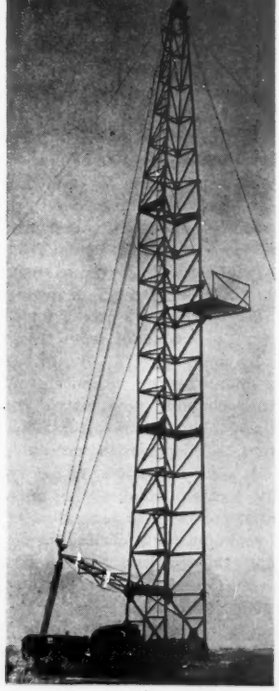


Franks SA Models of Portable Skid rotary
practicable in Franks truck-mounted "slim-ho
unit includes drawworks; catheads; two engi
pumps or hoisting equipment or to rotary driv
tained boom raising device; crown block; sta
of operation.

1. PORTABLE. Mounted on skids, or crawl
transported short distances in one piece. D
in 2 pieces for long moves.
2. EASILY ASSEMBLED. If units moved i
semble. Derrick quickly aligned with ta
3. SAVES ON LABOR. Arranged for 3-man
4. USES LESS WATER AND FUEL.
5. LIGHTEST WEIGHT. Derrick tubular
6. CORING FACILITIES.
7. PROPELLER SHAFT DRIVEN ROTA
CLUTCH.

Write Franks for furthe

RA



Five Models			SA-
Bore Hole	Casing	Drill Pipe	
6¼"	4½" OD	2⅞" OD	2,500' t
6¾"	4½" OD	3½" OD	2,000' t
7¾" to 7⅞"	5½" OD	3½" OD	1,500' t
8¾"	7" OD	3½"-4½" OD	1,000' t
11"	8⅝" OD	3½"-4½" OD	500' t
13"	10¾" OD	3½"-4½" OD	200' t

FRANKS MFG. CORP. WELL SERVICING AND DRILLING UNITS

Digests of A. P. I. Papers

Presented before the Southwestern district, Division of Production, at its spring meeting in Shreveport, La., February 27-28, 1941

A Technique for Determining Optimum Spacing of Oil Wells

PARK J. JONES (Petroleum Engineer, Fort Worth, Tex.)

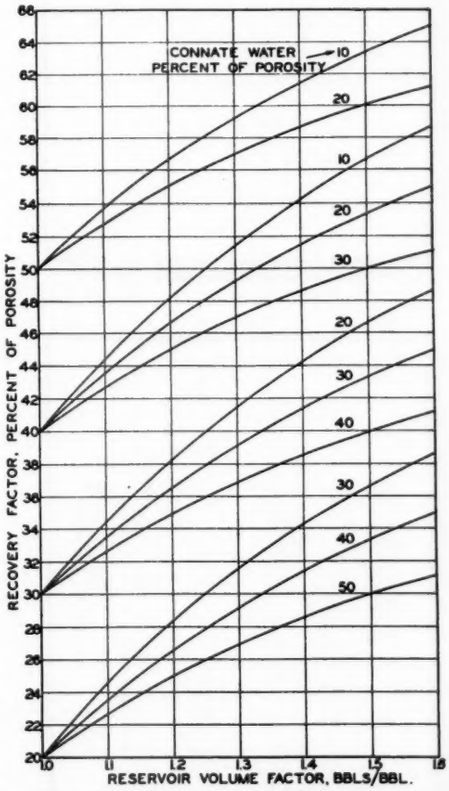
THIS paper presents a technique for determining optimum spacing in terms of the physical and economic factors controlling recoveries and costs. The procedure in computing optimum spacing is illustrated by examples worked out in detail for arbitrarily assumed reserves, allowables, and investments. The results apply only to the assumed conditions and are not intended to apply to any particular reservoir. However, the technique itself is applicable to determinations of optimum spacing on all reservoirs irrespective of whether their fluid content is gas, oil, or condensate. The method also applies to individual wells and properties provided migration of oil is accounted for.

Optimum spacing of wells is readily ascertained in terms of costs and reserves. However, as the technique for estimating reserves is not systematized, it is suggested that future efforts be of a composite nature towards the establishment of the fundamental variables which control ultimate recoveries from all types of reservoirs. Because of the number of wells drilled, the going cost of capital recovery ranges from 200 to 400 per cent above what it would be if operators were protected under equity. Whence, it is suggested that capital costs would be reduced if producers of oil could operate under equitable conditions as to allocation of allowables among wells in a given field and as to allocation of allowables among fields in a given oil region. If equity were effective, capital-recovery costs and, therefore, spacing would differ very much from those which operators must resort to in order to protect themselves under existing nonequitable conditions.

Three determinations of optimum spacing are made in terms of assumed reserves, operating costs, investments; and allowables on a per-well basis for 3,000, 7,000, and 11,000-ft. reservoirs. As the computations indicate that the per-barrel value of the 7,000-ft. reserves is only 50 per cent of the per-barrel value of the reserves in the other two reservoirs, a fourth example is worked out in terms of allowables on a per-acre basis. Also, a technique is outlined for determining reserves for various types of reservoirs in terms of the factors which control ultimate recoveries.

In regard to the latter, the author presented the accompanying set of curves and interpreted them as follows: The position of any one of the four groups of curves is controlled primarily by types of porous media, permeability ratios, and sources of pressure. The spread between curves having identical initial points is controlled by connate water and reservoir-volume factors. The individual curves show the effect of operating pressures on ultimate recovery in terms of reservoir-volume factors. Although pressures are not plotted in the figure, which is a composite picture of many reservoirs, in the case of a particular field, reservoir pressures would be shown. Lastly, no two points in the figure are comparative. The technique for determining a comparative basis may be illustrated by the following example.

The ultimate recovery from a reservoir, in which connate water averages 20 per cent and for which the reservoir-volume factor is 1.6, equals 250,000,000 bbl. and is producible by operating at pressures not less than the original bubble-point



Effect of operating pressures on ultimate recovery

value. The corresponding recovery factor is 55 per cent. However, if pressure is maintained, it is estimated that the rate of water encroachment will be such that operating pressures will decline in a manner corresponding to which the effective reservoir-volume factor would be 1.55, 1.45, 1.35, 1.25, and 1.15 and the recovery, 20 per cent of that corresponding to the respective reservoir-volume factors. Whence, the overall effective recovery factor is equal to 0.20 of the individual values. Thus, by the fourth curve from the top in the figure:

$$R = 0.20 \Sigma R_1 = 0.20(54.2+52.4+50.3+48.0+45.2)$$

or 50 per cent and the corresponding ultimate recovery is 50/55 or 227,300,000 bbl. The difference in favor of operating at not less than the original bubble-point pressure either by injecting gas or by holding the rate of volumetric withdrawal down to the volumetric rate of water encroachment is 22,700,000 bbl. The recovery difference is a consequence of shrinkage of oil not produced.

●

A Preliminary Survey of the Heaving-Shale Problem

H. H. POWER and CHARLES R. HOUSSIERE, JR. (University of Texas, Austin, Tex.)

FORMATIONS variously designated as "heaving shale," "sloughing shale" and "caving shale" impede and may even preclude drilling in various areas, and particularly in certain parts of the Gulf Coast. Great pressures are encountered in deep wells, and particularly in wells located on the steeply plunging flanks of salt-dome structures. It has been suggested that gliding or slipping of these steeply tilted beds is a major cause of the movement of shales into bore holes. It has also been noted that shales which contain bentonite absorb water from drilling fluids, swell, and thereby develop pressure which squeezes or "heaves" the shale into a well.

Some operators have reported that certain shales contain large volumes of gas under extremely high pressure. Pressure relief provided by the bore hole allows such gas-saturated shales to be blown into the hole with drastic consequences. Other operators have described a so-called plastic flow at considerable depth. They have postulated one essential difference between a shale which flowed plastically, and one which swelled due to hydration: as the plastic flow continued, its fluidity was thought to increase, and flow became progressively worse.

Many artificial causes have been assigned to the heaving-shale problem. It has been stated as a general premise that any mechanical operation in the drilling of a well which caused a differential in pressure between the troublesome formation drilled and the bore hole, was liable to promote movement of the shale into the latter. This pressure differential may be caused by so-called "swabbing action" incident to removal of drill pipe and bit from the hole. It may be caused by incorrect drilling rate, or rate of circulation of the drilling fluid. . . .

Heaving shales are generally characterized by certain individual properties, but it is not definitely established that they can be positively identified by any of them . . . There is some evidence that the replaceable alkaline earth ions are present to a greater extent than in ordinary shales. Heaving shales vary greatly in their reaction with water. Some absorb water and become quite plastic. Others crumble and disintegate, while others manifest no visible effect.

An essential difference between a shale under plastic flow and one which swelled due to hydration has been noted. As the plastic flow continued, its fluidity and rate of flow became progressively greater. Plastic flow may be more important in very deep than in shallower wells.

Physically, heaving shale has been classified as brittle ("buckshot"), compact, or "sticky." The brittle shale is said to contain only small quantities of bentonite, whereas the "sticky" variety supposedly contains a large amount, which promotes swelling upon hydration with water. The compact type is reported as being the most bentonitic and giving the most trouble in drilling wells.

Methods for Combating Heaving Shale

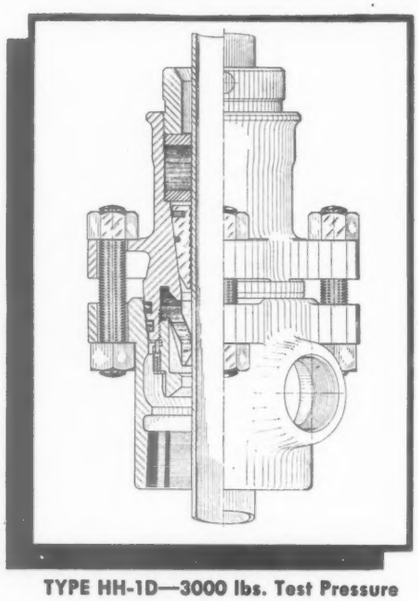
As a general consideration, the best proportions between hole diameter and drill pipe should be determined and maintained. Danger zones should be recognized in advance. . . . Mechanical methods for keeping the water from muds off

(Continued on Page 49)

MODERN PRODUCTION PRACTICE CALLS

NATIONAL TYPE HH-1D STRIPPER TUBING HEADS

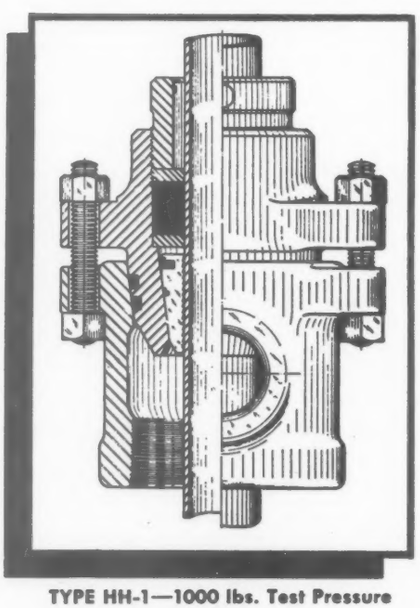
TYPE HH-1D—1000 lbs. Test Pressure



TYPE HH-1D—3000 lbs. Test Pressure

TYPE HH-1D—3000 lbs. Test Pressure

TYPE HH-1—1000 lbs. Test Pressure



TYPE HH-1—1000 lbs. Test Pressure

TYPE HH-1—2000 & 3000 lbs. Test Pressure

DOMESTIC

EXECUTIVE OFFICES
PITTSBURGH, PENNA.

•

GENERAL SALES OFFICE
TOLEDO, OHIO

•

DIVISION OFFICES
FT. WORTH, TEX. • TULSA, OKLA.
TORRANCE, CALIF.

THE NATIONAL

the shale have not been developed. It does not seem likely that any practical equipment will be developed to accomplish this purpose. On the other hand, the mechanical restraint of swelling shale seems impractical.

The maintenance of rotation of drill pipe except when changing bits, coring, or adding drill stem has been emphasized. Such a procedure was assured by having all equipment duplicated and of the most substantial type. All possible precautions were taken to prevent a shutdown.

Reduced pulling of drill pipe has been accomplished by the use of wire-line, collapsible-type drilling bits, and flush-joint stream-lined casing instead of drill pipe. "Swabbing action" has been prevented by circulating drill pipe out of the hole, stand by stand, and by continuous circulation as the pipe was pulled from the hole by the use of special continuous-circulation tool joints. High mud-circulation rates in turn may facilitate high drilling speeds if necessary. The circulation action, however, should be such as to not seriously disturb the disintegrating strata through sharp pressure differentials where troublesome beds are encountered. . . .

Mud weight appears to be an important physical property of drilling fluids up to a certain critical value, beyond which other properties may become of greater significance. Generally speaking, high-weight muds provide a high hydrostatic head which may oppose shear of the shale.

Fundamentally, the mud used to combat heaving shale should have the following properties: (1) Inert in relation to its effect on the shale and consequent heaving; (2) capacity to build thin, impervious walls rapidly, in order to seal off the formations from penetrating fluids; in other words, the filtration values of the mud sheath should be low; in some cases special emphasis may be laid on extra mechanical strength; (3) satisfactory viscosity, gel strength, and gel rate; (4) capacity to reduce the tendency of ion exchange between the mud and the formation with compression costs to give the greatest liquid yield at the lowest possible operating expense.

An analysis of the field data available by the use of these tests is as follows: The total liquid content of the gas can be determined by a measurement of the liquid and the gas by separation at a fixed temperature and pressure, and adding the separator liquid to the liquid obtained by charcoal adsorption from the tail gas. The retrograde behavior of the liquid and the optimum liquid-yield conditions can be found by making numerous separator tests at various conditions of pressure and temperature.

The liquid accumulating in the separator under any condition of pressure and temperature may be brought to atmospheric pressure either by stage or differential liberation of the dissolved gases. The fraction of the separator liquid that remains as a stable liquid under atmospheric pressure depends upon the method of liberating the dissolved gas. These factors may be obtained during field testing; such results are very near those obtained in a simple separation plant. Liquid content of the gas liberated from the separator liquid as it is reduced to atmospheric pressure may be determined in the field by charcoal adsorption, and the volume of dissolved gas per barrel of liquid determined at the same time.

By measuring the A.P.I. gravity of the residual liquid obtained from the various test conditions of separation and release of dissolved gas, gravity of actual separation-plant product is determined. Bomb samples of the liquid and gas can be taken at any convenient pressure and temperature during the test for chemical analysis.

●

Testing of Gas to Determine the Feasibility of a Recycling Plant

E. O. BUCK (Consulting Engineer, Houston, Tex.)

FIELD testing has proven to be an economical and accurate method of determining whether the liquid content of wet gas is sufficient to justify the building of a recycling plant. It must be remembered that if the liquid content of the gas is favorable there are many additional problems to be considered before the construction of a plant is undertaken. These other problems are concerned with a sufficient reserve of gas, the number of wells to be drilled, the location of the producing and input wells and producing-sand conditions. It can be better stated that the liquid content of the gas is a very vital part of a problem to be solved but only one of many conditions that must be found favorable before a plant can be built.

Field tests can be taken somewhat as follows: (1) The productivity index of the well or wells should be determined. This test will determine the number of wells necessary to supply a sufficient volume of gas for recycling operations. (2) The total liquid content of the gas must be known. This fact enables the operator to decide if the liquid yield is sufficient, for the volume of gas processed, to offset the expense of constructing and operating a plant. (3) The chemical composition of the flow stream must be accurately determined for a basis for plant design. (4) Complete liquid, pressure and temperature curves must be plotted on the mixture. These data balance the economy of plant operating pressure

●

The Application of Electrical Models to the Study of Recycling Operations in Gas-Distillate Fields

WILLIAM HURST and G. M. McCARTY (Humble Oil & Refining Co., Houston, Tex.)

MODEL analysis has recently achieved importance for the engineer in producing gas-distillate fields. The purpose of such studies is to obtain the necessary data on the arrangement of input and producing wells that will give the greatest recovery of wet gas in a reservoir, as well as the essential curves showing the instantaneous and overall ratios of wet to total gas production that can be expected over the life of an operation. The latter information, in particular, offers the criterion for fixing the depreciation on the recycling-plant equipment and gives the expected life of economic operation. The authors present a method of model analysis whereby these characteristic curves can be produced.

The basis for this analysis is that given a potential or pressure distribution between input and output wells in a reservoir, it is possible to construct a system of streamlines normal to the contours connecting points of equal pressure. These streamlines are the paths of flow of the gas between input and output wells. Further, knowing that the flow of gas along these streamlines explicitly obeys D'Arcy's law, which is that the velocity of flow along a curve is directly proportional to the potential drop per unit of length, we can determine the relative time it takes for a particle of gas to move over its corresponding streamline. Thus, if we follow the history of each particle of gas leaving the input wells at the same time and join these particles by a smooth curve for different successive periods, we obtain the wave fronts swept out by the dry gas in moving the wet gas toward the input wells.

The significant element in this study is to obtain the distribution of the electrical potential (voltage) in the reservoir. Theoretically, it is possible to write down the potential distribution for a system of wells located in an infinite reservoir, which can be expressed by a summation of logarithmic functions. For the more difficult case of a closed-in field, this would require a complicated analysis of Green's functions which might not even be amenable to solution. The simplest way, of course, to determine the potential distribution is by an electrical model, and this was the procedure followed.

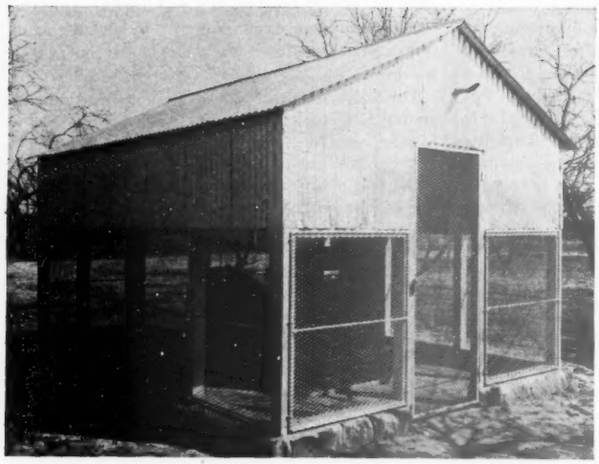
The medium employed was an electrolyte through which an alternating current was passed between the input and output wells. The purpose in using this conducting medium is that D'Arcy's law is obeyed explicitly by the analogous Ohm's law for the passage of electric current in a conductor. . . .

The experimental procedure consisted of balancing the current through various wells by adjusting the external resistances and reading a vacuum-tube voltmeter. This was a matter of "trial and error" to obtain the proper proportioning of current between each well, but once this balance had been made, it required only minor adjustments to compensate for a current drift resulting from surface oxidation of the electrodes serving as wells. In this study, the currents to each well were adjusted for the same rate. When a balance had been reached, however, the potential distribution was determined by moving a probe through the solution and reading the null system. Readings were started at a convenient point, close to a well, the potentiometer resistances adjusted until the earphones gave the least hum, and the null system switched to the galvanometer. On the galvanometer screen an off null point showed as a blurred image and by moving the probe, this blurred image could be made to coincide to a fine hairline which was the true null point. The complete contour for this particular potential was then traced out and the points thus determined plotted on a map of the field. The probe was then moved farther from the well and the process repeated until the potential distribution throughout the solution was mapped.

In this method, as well as for all the methods employed in recycling studies, it is tacitly assumed that the overall pressure drop between the maximum and the minimum potential well is necessarily small. This is a condition, however, which cannot be expected to exist for every recycling project, as it is conceivable that considerable pressure drops can occur for large amounts of gas recycled daily or for the case where the sand is of low permeability. The potentiometric method, however, is applicable for the study of recycling problems where large pressure drops may be encountered. In the treatment of this type of problem, it is required to determine the actual pressure distribution through the sand and to do this it will be necessary to assign the rate of gas to be recycled, the permeability and sand thickness, and finally a subsurface pressure for any one well of the two groups.

Another application for the potentiometric method is its adaptability for studying any change in a recycling program once it had been adopted and employed in a field for any length of time. This can occur, say, by relocating any one of the output or input wells, or changing the distribution of the supply of gas to and from these wells. To represent this change of program, it is necessary to set up the electrical model under the new conditions, to establish the potential and streamline distributions, and to carry out the time calculations along the streamlines as before, but instead of zero time being at the input wells, the zero time now corresponds to the points on these streamlines where the wave front had been when the recycling program was changed.

Operating Ideas



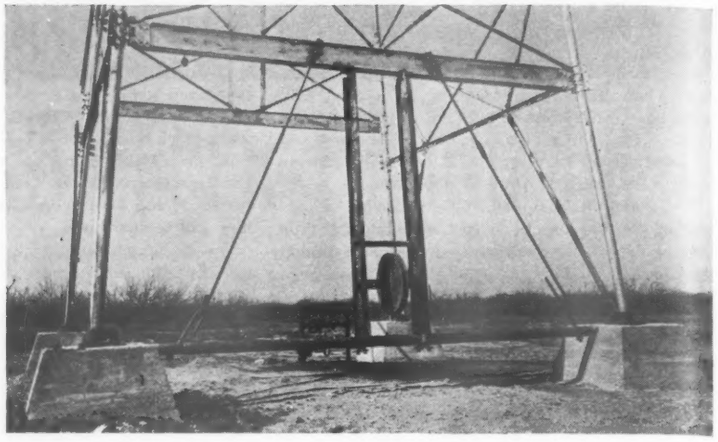
Heavy Screen on Pump House

To provide ventilation for a multicylinder gas engine driving a lease pump one operator in a North Texas field erected the open-air-type housing shown in the accompanying photograph. Only the upper part of the building is covered with metal sheeting while heavy-gage screen is used for the lower portion. This provides adequate ventilation, yet keeps leaves and trash from entering the building, as well as preventing pump or engine from being tampered with.

Rod Walkway Around Mud Pump

In the Seminole field of West Texas one oil company at its steam rigs uses walkways made from old rods around the mud pumps, and from the pumps to the boilers and feedwater pumps. Hinges attached to the walkway sections allow them to be easily fastened or removed from the mud-pump skid; angle-iron supports hold them in a horizontal position. The walkways are of advantage in that they keep the boiler man out of the mud and their added height makes it easier to perform repair work on the pump.

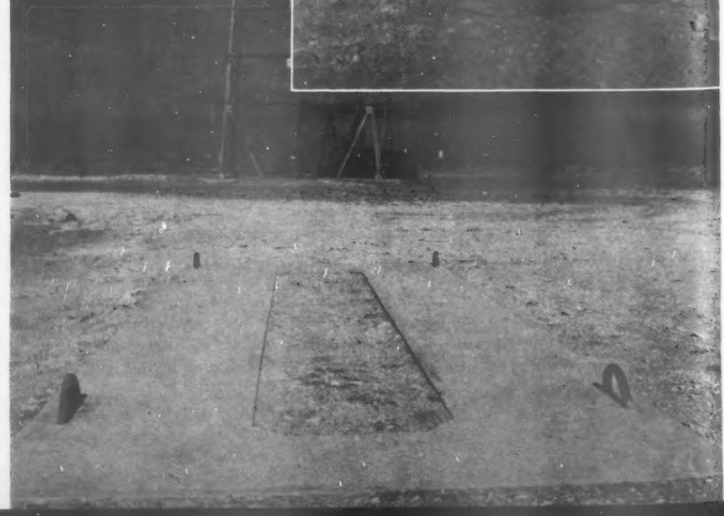
Permanent Pulley Facilitates Cleanout Work



In the Hull-Silk field of North Texas one operator is adopting the practice of installing pulleys in a framework at the base of the derrick, through which the wire line is run when the tubing is to be pulled. A 4-in. pipe is imbedded in the concrete foundations with vertical 10-in. angle iron placed between the pipe and the lower crossmember of the derrick to support the sheave. The uprights are bolted to the derrick member at top and U-bolted to the pipe, with a short section of pipe placed between the two pieces of angle iron to keep them in proper adjustment. Turnbuckles keep the crossmember from bowing when tubing is being pulled.

Concrete Foundation for Pulling Machines

At its wells in the Kermit field of Winkler County, West Texas, one major oil company pours concrete foundations for its pulling units due to the sandy nature of the soil. At wells having derricks, the truck foundation is set back from the well some distance, as shown in the lower photograph, with anchors set in the concrete to which the truck is anchored. If the well has no derrick over it, the foundation is poured only a few feet from the well head so that when the pulling machine is in place the mast will be centered over the well. Use of these concrete bases allows the units to be rigged up faster and prevents the machine from shifting while work is in progress.



Energy Requirements for Pumping Oil Wells

By S. B. SARGENT, JR.
Sargent Engineering Corp., Huntington Park, Calif.

A.P.I.—Presented at spring meeting of the Southwestern district of the A.P.I. Division of Production, Shreveport, La., February 27-28, 1941.

IN introducing this study we wish to call the reader's attention to the concept of the term "horsepower" as used throughout this paper. Horsepower is ordinarily defined as 33,000 ft.-lb. per minute. Fundamentally, however, this is but a unit of measurement of horsepower. Horsepower itself is fundamentally the product of mass acceleration and velocity.

The approach to the problem was started by plotting data from a group of wells in the form of a curve showing production as a function of depth. The wells selected were scattered throughout various areas in the United States. The question arises as to the pumping fluid levels on wells having extraordinary or peak performance. A large group of wells lying along the peak-performance curves were checked for pumping fluid levels. On basis of this information the peak-performance curve is reasonable, and the wells lying along it were reasonably well pumped down, and the depths represented consistent.

Some theoretical basis for the performances involved was then sought. It was felt that the solution might lie in the horsepower which any given string of sucker rods might transmit.

The first step in the study was to develop a method of evaluating the hydraulic horsepower required. The hydraulic horsepower required to produce a well is given by the expression:

$$\text{Hp.} = (\text{Bbl./day}) \left(\frac{\text{Operating depth}}{1{,}000}\right) (0.0074)$$

From this of course it is necessary to subtract the work done by expanding gas. An approximate expression for the horsepower available by expanding any given volume of gas is:

$$\text{Hp.} = (\text{P. V.} \log_e \frac{P_2}{P_1}) \ (4.75 \times 10^7)^{-1}$$

The utilization of this energy is determined by the efficiency of the system. Fig. 1 is the probability curve for gas-lift efficiency as determined from about 450 installations. The most probable efficiency according to this curve is 10 per cent. This value seems reasonable and in keeping with the general opinion expressed by various operators.

The determination of the horsepower transmitted by a string of sucker rods is based on the conception of the work involved in deforming them and the number of times per second that this is done at a frequency equal to the natural period of the rods.* The natural frequency was chosen as it is the frequency with which the rods vibrate on the imposition of any given force upon them. The expression for the horsepower which the rods will transmit under these conditions is:

$$\text{Hp.} = \frac{S_2^2 - S_1^2}{2E} \times V \times \frac{1}{2\pi} \times \sqrt{\frac{K_g}{W}} \times \frac{1}{12} \times \frac{1}{550}$$

Where:

S_2 is the final stress
S_1 is the initial stress
V is the volume of the rods
K is the force required to stretch the given string of rods 1 in.
g is the gravity constant in inch units
E is the modulus of elasticity
W is the weight of the fluid plus one-third the weight of the rods

The stress used in this determination is the average stress throughout the string of rods. The stress throughout the length of the string varies as a sine curve, and the point of location of maximum stress is a function of the mode of vibration. The maximum stress at any given time in the string of rods is $\pi/2$ times the impressed stress.

The maximum allowable stress at the polish rod may be determined either by data published by H. N. Marsh[1] and B. H. Robinson[2] or in our experience by the expression used by some operators.

$$S_{max} = 24{,}000 + 0.56\, S_{min}$$

Where:

S_{max} is the maximum stress allowed
S_{min} is the minimum stress

On the basis of these determinations the various curves exhibited (see Figs. 2, 3, and 4) were drawn. The theoretical curves based on safe working stresses indicate results in conformity with the general data obtained from the field. Data points lying above the theoretical curve can be explained in most instances by substituting the stresses encountered in the particular case for the 27,000 lb. per sq. in. used in constructing the curve.

For illustration we offer the following example:

Depth: 7,400 ft.
Rod string: 2,000 ft. of 1-in., 3,000 ft. of ⅞-in., 2,400 ft. of ¾-in.
Stress in polish rod: 33,000 lb. per sq. in. maximum, 18,000 lb. per sq. in. minimum.
Production: 720 bbl. per day.
K = 194 lb. per in. of stretch.
V = 53,000 cu. in.
Type of unit with which rods vibrate as a system with free ends.

Maximum stress in string is therefore:

$$(\pi/2)\ 33{,}000 = 52{,}000 \text{ lb. per sq. in.}$$

The average stress becomes:

$$(33{,}000\ \pi/2 - 33{,}000)\ 2/\pi + 33{,}000 = 45{,}000 \text{ lb. per sq. in.}$$

The weight of the fluid with the 2¼-in. plunger which was used is:

$$7{,}400 \times 3.9761 \times 0.36 = 10{,}600$$

One-third the weight of the rods is 5,800 lb.

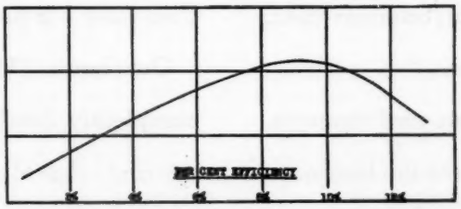
Substituting these values in the expression for horsepower we have:

$$\text{Hp.} = (45{,}000^2 - 18{,}000^2) \times 52{,}000 \times 3.127 \frac{194}{16{,}400} \times 1/12 \times 1/550$$

Hp. = 81.5 hp.

As was pointed out in the opening statement, horsepower is the product of velocity, acceleration and mass. As useful velocity is available only on the upstroke, the hydraulic horsepower which the installation is capable of delivering is one-half this figure. The horsepower which the installation is capable of delivering is therefore 40.25 hp. The horsepower which is required is:

$$720 \times 7{,}400 \times \frac{0.0074}{1{,}000} = 39.5 \text{ hp.}$$



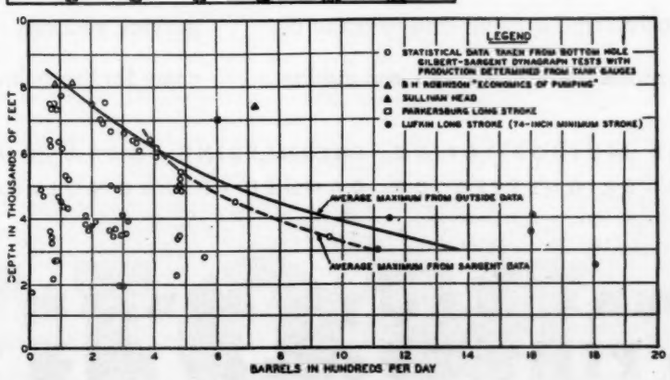

LEGEND
STATISTICAL DATA TAKEN FROM BOTTOM HOLE GILBERT-SARGENT DYNAGRAPH TESTS WITH PRODUCTION DETERMINED FROM TANK GAUGES
B H ROBINSON "ECONOMICS OF PUMPING"
SULLIVAN HEAD
PARKERSBURG LONG STROKE
LUFKIN LONG STROKE (74-INCH MINIMUM STROKE)
AVERAGE MAXIMUM FROM OUTSIDE DATA
AVERAGE MAXIMUM FROM SARGENT DATA
DEPTH IN THOUSANDS OF FEET
BARRELS IN HUNDREDS PER DAY

Fig. 1 (left)—Probability curve for gas-lift efficiency based on 450 installations. Fig. 2 (below)—Rod-capacity data

The example chosen is for an actual well, and is shown on the data sheet. The well has operated for over 1½ years without a rod break, pumping 720 bbl. from 7,400 ft. This, of course, was to be expected since the stresses and range of stress were within the allowable maximums.

Of interest at this point, though a digression from the con-

(Continued on Page 54)

*An analysis of the horsepower transmitted by sucker rods and the stresses involved was presented in an appendix, which is not given here.

LONG TERM ENLISTMENT

Long, trouble-free service from the tool joints has a welcome way of keeping drilling costs down, which explains the growing preference for Chrome-Molybdenum (SAE 4140) steel for this service among drillers.

Joints made of this steel have the essential strength, toughness and fatigue strength. They have the hardness necessary to resist abrasion and erosion and to stand the wear and tear of being made up tight and broken out fast.

In addition, because of the properties of SAE 4140, tool joints made of it have bores large enough to permit free fluid flow — a further aid to drilling efficiency.

Our book, "Molybdenum Steel in Oil Production," completely describes the properties and applications of this and other Molybdenum steels which are establishing service records in the field. We will gladly send you a copy for the asking.

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Progress in METALS

By W. L. NELSON

Nitrided Stainless Steels

THE superior corrosion resistance of stainless steel is well recognized, and likewise, the hardness imparted by nitriding needs no introduction. However, until recently no mention has appeared of the nitriding of stainless steels. The corrosion resistance of the stainless steels is adversely affected by the nitriding operation but in most instances the decrease in resistance is negligible. The hardness of the nitrided surface is extremely high, being as follows:

Test temperature, °F.	Vickers Brinell hardness
70	1,050
1,000	710
1,400	540

These results were obtained by the application of a surface that was only 0.010 in. thick on a sample of 18-8 chromium nickel stainless steel which has a Brinell hardness of 145-160 at room temperature.

The following quotation from "Nitrided Stainless Steels" by Horace Drever of the Drever Co. of Philadelphia, which appeared in the September issue of Metals and Alloys is noteworthy:

"Since the principal object of surface hardening these steels is to produce wear resistance, it is interesting to note the comparative tests on these materials in a standard type of reciprocating wear-testing machine. The table indicates the relative amount of wear of two classes of stainless steels before and after nitriding, and of Stellite, which is frequently used where corrosion and wear resistance are required.

ABRASION LOSS OF NITRIDED STAINLESS STEEL AND OF STELLITE

	18 Cr, 8 Ni Type 302		12-14 Cr Type 410		
	Normal	Nitrided	Normal	Nitrided	Stellite normal
Loss in weight, gms./100 gms.	0.85	0.002	3.35	0.018	0.0358
No. of strokes at 100 lb. pressure	6,000	30,000	10,000	50,000	30,000

"The principal reason for using stainless steel is, as the name indicates, to insure resistance to corrosion, and this phase of the subject is of paramount importance. It should be stated at this point that the corrosion resistance of all classes of stainless steel is somewhat impaired by the process of nitriding, but for a vast number of applications not sufficiently to be in any way detrimental. Nitrided stainless is not recommended for use in contact with the heavy acids, such as nitric acid. No apparent effect on the corrosion resistance is noted for these materials in contact with high-pressure high-temperature steam, gasoline, kerosene, and fuel oil, ordinary city tap water, and many other corrosive agents. In alkaline boiler-feed water at 380° F. that material stains lightly but does not etch or pit, and would be given a Class B rating under the A.S.T.M. rating system.

"In the salt-spray test, independent laboratories have reported widely different results, which cannot be reconciled at this time, but it is sufficient to say that the resistance to salt spray is impaired to an extent undetermined at the present time. Data on this are now being accumulated and will be reported at a future date, together with results of long-time immersion in sea water and long-time tests under alternate immersion in sea water and exposure to air. Because of the great number of types of stainless steel that are now in common use it necessarily will take a considerable period of time to give a qualitative rating to cover the general class."

In the oil industry nitrided stainless steel can be used for pump shafts, valve seats, high-pressure valves, and parts of oil-well pumps and plungers.

Welding Terms

Stress-Relief Heat Treatment

THIS operation is defined as the uniform heating of a welded structure or portions thereof in proximity to the weld, to a sufficient temperature below the critical range, to relieve the major portion of the residual stresses, followed by uniform cooling.

In years past, the major objection to the use of welding was centered about the fact that the base metal that surrounded the weld was often embrittled or weakened because of residual stresses. Such difficulties have now been largely overcome by improvements in the technique of welding and in extreme cases by the stress-relief heat treatment discussed here.

Such terms as normalizing, annealing, etc., are misnomers for this application.

Metals for Bursting Disks

Abstract: "Designing for Failure" by R. V. Sutherland, Steel, Vol. 107, Aug. 12, 1940, p. 46. Taken from Metals and Alloys of Nov. 1940.

METALS are the most satisfactory materials for bursting disks. In these, the metal must flow under "near-bursting stress" until it attains such a shape as permits the minimum stress for the load. Almost all metals obtainable in sheet form, including aluminum, copper, steel, stainless steel, monel, gold and platinum, have been used.

Laminated combinations of base and more precious metals are most generally employed, with laminated aluminum-and-gold and aluminum-and-silver classed as new comers. Aluminum and copper are most widely used.

The metal must be thick enough to flow into the new semispherical shape without excessive thinning. Disks have been made as thin as 0.002 in. The disks will ordinarily be stressed to two-thirds their ultimate strength under ordinary working pressure. With many materials, this means they are stressed beyond their elastic limit. The determining factor for maximum permissible stress is the "upper creep limit" or the value beyond which the materials flow so rapidly as to fail in a comparatively short time. Metals like lead, tin and zinc are unsuitable for disks because their creep limit is so low compared with their ultimate strength.

Where pressure vessels are subject to pulsations, fluctuations, or alternate pressure and vacuum, the fatigue limit is likely to be the determining factor in figuring the ratio of bursting pressure to working pressure. Working pressures must be held considerably below those for more static loads. For example, an aluminum disk will serve more satisfactorily under severe pulsation if the ratio of bursting pressure to working pressure be 2 rather than 3/2.

The choice of metals and range of bursting pressures narrow sharply for high-temperature applications. Aluminum is worthless at above 300° F. Copper has been used successfully at somewhat higher temperatures. Stainless steel and monel are most suitable for very high temperatures. Nickel has the apparently unique and valuable property of preserving an upper creep limit very close to its ultimate strength at comparatively high temperatures.

Rationing of Metals

A DISPATCH from Washington, D. C., dated February 21, by the United Press indicates that rationing of certain metals that are used for light metal construction may be necessary. Among the metals contemplated are aluminum, zinc and nickel. Aluminum is a primary constituent of light alloys, zinc is a component of cartridge brass, and nickel is needed for high-strength steels.

The rationing will be directed mainly against the use of these metals for common articles that are not necessary for defense. Such articles are aluminum kitchenware or washing machines, brass household fixtures or galvanized articles, and nickel-plated restaurant and plumbing fixtures.

Molybdenum-Steel Fishing Tool

USE of nickel chromium molybdenum steel for the body, cage and bottom swage of a fishing spear is announced in the Moly Matrix of January 1941. The fishing spear is made by Brown Oil Tools, Inc., of Houston, Tex. The selection of molybdenum alloy steel for such a service is based primarily on the high strength, great shock resistance, and superior hardness of such a steel. The sum total of these advantages results in a tool that weighs no more than an ordinary carbon-steel tool but is greatly superior in load-carrying capacity and toughness.

The superior properties of alloy steels are of double value in the case of fishing tools because of the extreme conditions under which the tools sometimes operate and because of the penalty in cost and delay that arises when a tool fails to accomplish its job or adds to the fishing problem by breaking. A fishing spear may be used to retrieve a stuck pipe or liner from a well. This is accomplished by making up a fishing string which is run down inside the stuck pipe. The pipe is cut off at a suitable point and the spear slips are expanded to grip it from the inside. An attempt is then made to lift the stuck pipe by a direct pull. This may involve a load of 300,000 lb. If this fails the jar is put into service. The jar is used to strike a series of heavy blows by using the weight of the whole string as a hammer to loosen the pipe.

The S.A.E. steel used for this fishing tool contains 0.4 per cent carbon, 0.55 per cent manganese, 1.85 per cent nickel, 0.45 per cent chromium, and 0.25 per cent molybdenum. After quenching in oil from 1,475° F. and drawing at 925° F., the physical properties of the steel are about as follows:

Tensile strength, lb. per sq. in.	190,000
Yield point, lb. per sq. in.	180,000
Elongation in 2 in., per cent	15
Izod impact, ft.-lb.	25
Brinell hardness No.	375-400

This type of steel is used for the body, bottom swage and cage of the spear.

The slips are constructed of case-hardened S.A.E. 4615 steel which contains 0.15 per cent carbon, 1.80 per cent nickel and 0.25 per cent molybdenum.

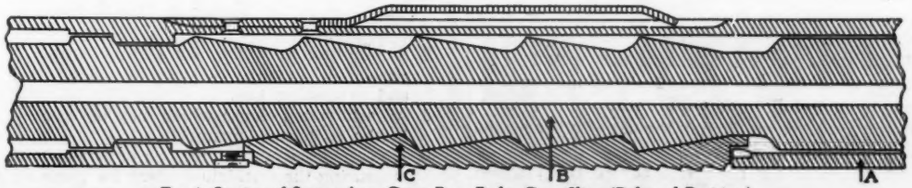
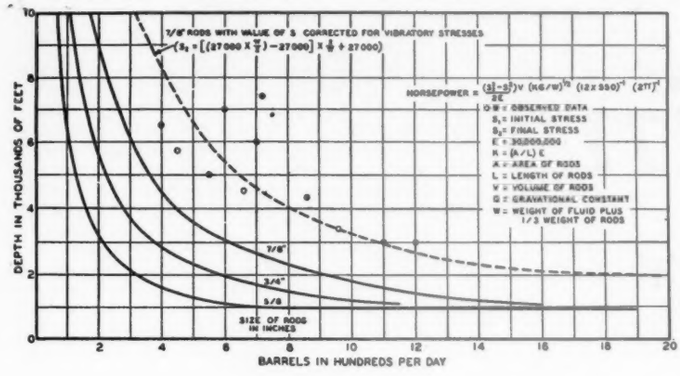


FIG. 1. *Section of Spear: A = Cage; B = Body; C = Slips (Released Position)*


7/8" RODS WITH VALUE OF S CORRECTED FOR VIBRATORY STRESSES
HORSEPOWER = $\frac{(S_i - S_f)V\ (NG/W)^{1/2}\ (12 \times 990)^2\ (2\pi f)^2}{2E}$
O = OBSERVED DATA
S_i = INITIAL STRESS
S_f = FINAL STRESS
E = 30,000,000
R = (A/L) E
A = AREA OF RODS
L = LENGTH OF RODS
V = VOLUME OF RODS
G = GRAVATIONAL CONSTANT
W = WEIGHT OF FLUID PLUS 1/3 WEIGHT OF RODS
7/8"
3/4"
5/8
SIZE OF RODS IN INCHES
DEPTH IN THOUSANDS OF FEET
BARRELS IN HUNDREDS PER DAY

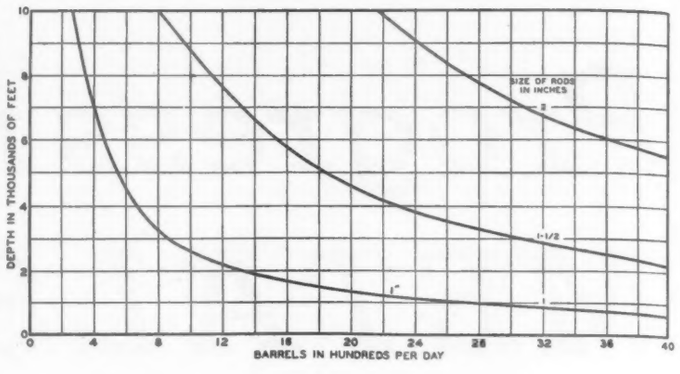


Fig. 3 (left)—Capacity of sucker rods (27,000-lb. per sq. in. maximum stress, 5,000-lb. per sq. in. minimum stress). Fig. 4 (right)—Computed rod capacities based upon 27,000-lb. per sq. in. maximum rod load

Energy Requirements for Pumping Oil Wells

(Continued from Page 51)

tinuity of thought, is the location of the points of maximum stress concentration. When the rods vibrate as a body with free ends, the location of the point of maximum stress concentration is the middle of the string. The middle of the string may be actually the geometrical middle, or the projected middle, as determined by allowing an equivalent length of rods for the weight of the fluid. When the rods vibrate as a body with one end fixed, the location of the point of maximum stress is at the top end of the string. Advantage of these factors should then be taken in installing equipment to obtain the optimum result. Curiously in some installations, such as in the Wink, Tex., area, the projected middle of the string is immediately above the plunger.

Another rather outstanding fact is that sucker-rod pumping installations are all relatively high or large horsepower installations as compared to other methods of artificial lift. This factor has sometimes retarded sucker-rod pumping installations until such time as the wall's hydraulic horsepower requirements become too large for low-first-cost small-horsepower installations ordinarily used. It suggests the possibility of smaller sucker-rod pumping installations during the period of the well's life when the horsepower requirements are low, and the installation of a larger pumping unit as the horsepower requirements are increased. This scheme offers the possibility of low capitalization costs, because of both the high salvage value of the installation at the time when it becomes necessary to increase the power available to produce the well and the low cost per unit of power for sucker-rod equipment.

This study suggests that sucker-rod pumping has an exceedingly wide application, both as to depth and quantities of fluid which can be produced by the method. It carries the further suggestion that large quantities of fluid, such as 15,000 bbl. per day, are within the realm of sucker-rod pumping. The paper further suggests the possibility of successful pumping of depths of 12,000 to 15,000 ft.

Perhaps the most pertinent suggestion is that sucker-rod pumping installations are the heavy-duty lifting installations commonly used for pumping oil, and that they are capable of even further development in this field of application. The corollary of this statement can well be perhaps that in many light installations, heavier pumping installations than necessary are used, which has often resulted in the use of other means of producing oil being used, whereas the pumping installation might have well served the purpose to better advantage.

References

1. H. N. Marsh: "High Volumetric Efficiency in Oil-Well Pumping and Its Practical Results"; midyear A.P.I. meeting Dallas, Tex., June 1931; Production Bulletin 207, p. 60.
2. B. H. Robinson: "Deep-Well Pumping in the Santa Fe Springs Field"; in "Improvements and Trends in Production Practice," by W. W. Scott; twelfth annual A.P.I. meeting, Chicago, November 1931; Production Bulletin 208, p. 175.

Practical Economics of Cycling

(Continued from Page 43)

ficiently high to permit paying the full one-eighth of the plant products, or other royalty required in the mineral and subsequent leases or transfers, it is usually a relatively easy matter to obtain majority-interest signatures on the necessary unit agreement and division order. . . .

The probable success of a request for royalty-payment reduction is partly dependent upon the past production history of the particular property. If the field is relatively new, royalty owners may be inclined to believe that, in spite of the contention of the leaseholder for reduced payments on account of lean content, the property, being productive, is very valuable and the royalty is likewise valuable. . . .

As a result, certain psychological factors are at play in dealings with the royalty owners, relatively little difficulty being encountered in securing agreement to a reasonable unitization plan if the property has been wholly or partially developed without attendant material production, while considerable difficulty is oftentimes encountered if little or no development has taken place. The royalty-unitization agreement should contain many provisions, including the following:

1. The right to commingle gas for processing and the right to inject dry gas anywhere on the structure.
2. The method of allocating production between units, if more than one unit is organized.
3. The method of apportioning production within the unit.
4. A provision for reducing, or entirely eliminating, drilling obligations.
5. A provision which will allow for the entrance of additional acreage to the unit on an equal sharing basis, or a provision which will permit the establishment of additional units, either of which provisions should set forth the minimum quantities of gas that must be processed for recovery.
6. A provision for the sale of residue gas and the method of allocating income derived therefrom.
7. A provision to allow the plant operator a reasonable quantity of gas for plant fuel and processing loss.
8. An arbitration clause which may be invoked in the customary manner.
9. A description of the methods of testing and measuring the distillate content for purposes of allocating or apportioning production.

Arrangements for financing, constructing, and operating the cycling project.

Due to the relative newness of cycling operations, some financing agents have been hesitant to participate because of lack of experience. Generally speaking, however, a good and potentially profitable enterprise can be readily financed. There are at least five ways in which the complete project can be handled from its inception to and including its ultimate exhaustion; first, the company, or group of companies, owning the leases furnishes the capital, prepares the necessary economic analysis and the necessary engineering specifications and lets a contract for the construction job, operating the plant themselves after its completion. Second, the company, or group of companies, owning the leases furnishes the necessary capital, lets contracts for the design and for the construction of the complete physical plant, and operates the plant after its completion. Third, the company, or group of companies, farms out its gas-distillate leases or sells to another party and retires on an overriding royalty. Fourth, the company, or group of companies, owning the leases furnishes capital for and supervises the field development; cycling interests furnish capital for and install and operate the cycling plant for some share of the recovery. Fifth, the company, or group of companies owning the leases, furnishes gas to other parties who finance and install the plant, cycle the gas and store and load the recovered products for some predetermined flat charge per unit volume of gas handled. . . .

Conclusion

As has been indicated previously, all of the factors that make up the economic balance sheet of cycling operations can be determined with a degree of accuracy commensurate with any other type of oil-field operations. Since this is the case, it is not prudent to hazard relatively large investments without first assembling the information necessary to completely portray any reasonable combination of circumstances that may enter into the economics of operation. The total cost of the preliminary investigation and the detailed engineering analysis is small.

The cost of the unitization efforts may be appreciable, these expenditures varying in proportion to the number of interested parties that may be involved. Since the work required up to the point of unitization efforts is relatively inexpensive, it logically follows that the process of establishing a cycling project can be made very orderly and investments kept to a minimum except as the project seems to develop and warrant the undertaking of activities which become very costly. Finally, the arrangements or commitments for field development and physical plant construction are not made until the success of the project is assured with at least that minimum of return that is acceptable to the financing agent or to the individual company policy.

Pipe-Line Activity

Foreman and Bechtel Get Contracts From Natural Gas Pipeline

Natural Gas Pipeline Co. of America has awarded contracts for two looping projects totaling 219 miles of 26-in. gas line on the main trunk-line system connecting the Panhandle with Chicago and other northern markets. W. A. Bechtel Co. received a contract for 121 miles for a section extending from the vicinity of Borger Tex. into Kansas. C. S. Foreman Co. received a contract for 98 miles from Wilson, Kans.

Dempsey-Wilson Construction Co. has completed work on its contract to lay 101 miles of 20-in. pipe line for Natural Gas Pipeline Co. of America from the compressor station at Geneseo, Ill., to the vicinity of Belvidere, Ill.

Southern Natural Lets Contract To B and M Construction Corp.

Southern Natural Gas Co. awarded a contract to B and M Construction Corp. for the 135-mile, 14-in. line from Logansport, De Soto Parish, Louisiana, to Monroe, La. Engineering work is in the hands of Ford, Bacon & Davis. The line will cost $2,500,000. At Monroe it will tie in with the company's trunk line extending into southeastern states.

The line will be coated throughout its entire length. Part of the line will be wrapped. The contractor will use two gangs. Gas for the line will come from the Rodessa gas-producing sands of the Glen Rose.

Republic Builds Line in Oklahoma Panhandle

Republic Natural Gas Co. is building a 21½-mile pipe line in the Guymon sector of the Hugoton district, Texas County, Oklahoma, to connect to properties recently purchased and to increase outlet for the sector.

It is reported that Republic Natural Gas Co. has purchased from A. J. Hardendorf the Wiggins gas wells, on Sections 1 and 2, Township 2, Range 14, Texas County, about a mile southwest of Guymon, which have been shut in since they were drilled in 1938.

Magnolia Lays Two Lines In Corpus Christi Area

Early this week work was started on two lines for two Magnolia companies from La Gloria, Jim Wells County, Texas, to Corpus Christi, Tex. The distance is 62 miles. One of these will be a 6-in. line constructed for Magnolia Petroleum Co. for the transportation of gasoline and refined products from La Gloria recycling operations. Paralleling this line Magnolia Pipe Line Co. will be building a crude-oil pipe line between La Gloria and Corpus Christi for the shipment of crudes between 22° and 38° A.P.I. gravity. This line will consist of 7 miles of 8-in. near Corpus Christi, 6-in. from Corpus Christi to the Seligson ranch, and 12 miles of 4-in. from the Seligson ranch to La Gloria. Two separate contracts for work on the two lines have been let by the two Magnolia companies. These contracts have been let to Williams Brothers Corp. and they include all of the lines mentioned with the exception of the 12-mile stretch between La Gloria and the Seligson ranch for which the contract has not yet been let. Williams Brothers Corp. maintains a warehouse at Corpus Christi where construction operations will be directed. The contractor's work will be supervised by Joe Horrigan and Ben Law. Construction will be done by two gangs, one on each line. Work is to be completed by April 15. The two projects together represent a total of 124 miles.

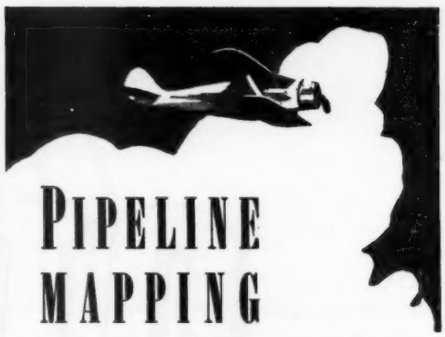
Wabash Lets Contract to Williams Brothers Corp.

Wabash Pipe Line Co. (Pure Oil Co.) has awarded a contract to Williams Brothers Corp. for the construction of 9¼ miles of 4-in. from Calvin to Centerville, White County, Illinois. At Centerville oil will be delivered to the Illinois Pipe Line Co.'s system for transportation eastward. The contractor is starting work on the job this week. The pumping station at Calvin will be located on ground which has been subject to inundation during periods of high water. Dikes will be constructed for the protection of the station facilities.

Georgia Legislature Considers Pipe-Line Right-of-Way Bill

The bill which has been drawn for the purpose of enabling common-carrier pipe lines to procure right-of-way through condemnation proceedings has been recently voted out of committee by the lower house of the Georgia Legislature by a vote of 35 to 30. This bill, designated as H. B. 41, is intended to correct a defect in the state's law which proved to be an obstacle which prevented the completion of the 450-mile gasoline line of Southeastern Pipe Line Co. (Gulf and Pure) from Port St. Joe, Fla., to the Tennessee State line near Chattanooga, which was under construction last year.

The Georgia Legislature adjourns in less than 3 weeks. Unless provision is made for a special session before adjourning the legislature will not meet again until January 1943. Because of the importance of pipe lines in this area in the national-defense program, President Roosevelt has asked that the obstruction of the pipe lines by railroad interests in southeastern states be investigated in order that interference with the procuring of rights-of-way across railroads be eliminated. At the end of December 1940, Southeastern Pipe Line put in operation a 96-mile section of the line between Port St. Joe, Fla., and Bainbridge, Ga. This part of the line continues to be in operation.



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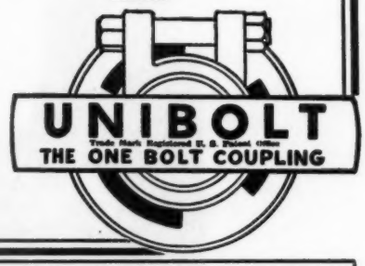

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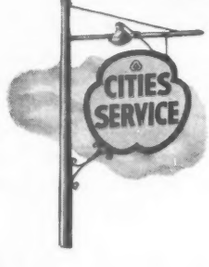


FIELD DEVELOPMENTS...

HIGHLIGHTS FROM THE WEEK'S NEWS—

Completions remain steady with a decline of five from the previous week, although oil wells were up five. Glancing over the week's news, the most significant features are the definite limiting of the Hawkins field in East Texas and the number of deep tests reported. A well in West Virginia is slowly working its way through quartzitic sandstone at 9,871 ft. Amon Carter's deep test in the Wasson field in West Texas is below 10,000 ft. and a Crane County wildcat is at 9,603 ft. In Oklahoma, Magnolia is planning a recycling operation involving a 9,400-ft. pay. An 11,834-ft. test in the Lisbon field has been plugged back and is completed in a 10,250-ft. sand.

California had rather an off week with only one 10,000-ft. completion but has six wildcats below that depth, two below 11,000 ft., in fact. The Gulf Coast had seven 10,000-ft. completions, one in Texas and the remainder divided among four parishes in Louisiana.

Operators today have developed techniques which add greatly to known reserves. Almost insensibly the practice of drilling to the lowest known pay or to the physical limits of the equipment has come into being. Greatly improved logging devices and formation testers suggest which of several possible pays to produce first. Multiple-sand production has, like water, ceased to be a menace, and the economic limit of production has been forced farther into the future.

OKLAHOMA: Oklahoma's first major discovery of the year is the new Guthrie pool along the Langston-Crescent trend. The discovery well flowed an estimated 5,000 bbl. when it was shut in for tankage. A Hunton pool was opened east of the Seminole pool when a Wilcox test was plugged back and completed in that formation. Magnolia Petroleum Co. is making arrangements to unitize a block in Dewey County where what appears to be a large structure has shown wet gas between 9,000 and 10,000 ft. If successful, a large recycling plant will be constructed. Operators in Oklahoma City have been working out plans to repressure this field with a view to obtaining an additional 100,000,000 bbl. which they estimate will be left in the pool when the present wells are exhausted. The plan has been presented to the legislature together with a recommended bill. Repressuring of shallow sands is now an old story but the Oklahoma City plan involves repressuring of a highly permeable 6,500-ft. pay with a number of closely drilled areas interspersed with larger leases which were developed on a regular pattern. To complicate the matter further, ownership of the mineral rights is divided among thousands of individuals who are scattered from Nome, Alaska, to Miami, Fla., with some representation in Europe (p. 62).

KANSAS: The Hall-Gurney field is extended ¾ mile east in the Lansing-Kansas City pay (p. 60).

ILLINOIS: Despite disappointments at Centralia and small wells in Salem, operators are still trying for Trenton production. A sixth pay, the Waltersburg, is producing in the Calvin field. The next townsite development may be in Fairfield as McClosky production has been found 1 mile west of the city (p. 77).

SOUTHWEST TEXAS: The old Balcones district is the scene of revived activity as four probable pool openers are being tested. A formation, believed to be the Glen Rose lime, is producing in the Tanglewood area, Lee County. The other tests are in Caldwell, Medina and Wilson counties. Willamar is extended 1½ miles to the northwest and a test southeast of the discovery is shut down while an upper gas sand is being squeezed off (p. 65).

NORTH LOUISIANA: Extension of the Smackover lime into Louisiana as a producing formation was proved when North Louisiana's deepest test flowed 422 bbl. of condensate in 16 hours from that formation at 10,148-10,393 ft. (p. 58).

NORTH TEXAS: With six wells proving a strip containing over 1,000 acres, the deep Ellenburger pay in K.M.A. is proving of major importance in the field. The Ellenburger has always been a better promiser than performer in the North Texas area and has not been highly regarded, except as a last resort. The K.M.A. development may reverse this opinion and, at the same time may indicate deep-seated structural trends from which the Ellenburger may prove productive (p. 63).

CALIFORNIA: Deep wildcatting is reaching a peak with six tests below 10,000 ft. Meanwhile independents are crowding into the Newhall-Castaic district in northern Los Angeles County where there are some 50 structures awaiting test. The opening of two new fields recently as well as the record price paid for a large lease are helping to increase interest in this sector (p. 72).

LOUISIANA GULF COAST: The Lowry prospect, Cameron Parish, has been added to the list of gas-distillate producers as a sand at 9,970-75 ft. flowed 3 to 4 bbl. of distillate an hour with 4,000,000 cu. ft. of gas (p. 79).

COLORADO: The Sundance has been proved productive in the Wilson Creek field which formerly produced from the Morrison (p. 71).

WEST CENTRAL TEXAS: The Akard and Stith areas in Jones County are active with a second producing sand (the Swastika) in Stith, a Cook sand discovery between the two pools, and a discovery 6 miles north of Akard in the Hope sand (p. 63).

WEST TEXAS: With seven fields in Pecos, Ward and Crane counties producing from the Ordovician, interest in the deeper pays is increasing. Several wildcats are on their way down and the leasing activity has spread into Winkler County with deep pays as the probable objective (p. 66).

EAST TEXAS: The Hawkins field now appears to be defined on all sides and lenticular conditions in the Woodbine combined with erratic saturation limit the proven area to about 2,500 acres at the most (p. 80).

TEXAS GULF COAST: Jackson County continues to lead in interest as a new gas field is opened north of Edna and a new deep sand is producing gas and distillate at West Ganado (p. 75).

COMPLETIONS IN ALL FIELDS . . .

(Week ended March 1, 1941)

	Oil	Gas	Dry	Total	1941 total comp. to date	1940 total comp. to date
N. Y., Pa., and W. Va.	46	21	7	74	708	605
Ohio	7	21	4	32	219	124
Indiana	1	2	1	4	61	49
Kentucky	2	3	3	8	90	57
Illinois	37	0	19	56	461	534
Michigan	7	0	8	15	148	205
Kansas	21	0	9	30	259	214
Oklahoma	10	3	11	24	233	253
Nebraska	0	0	1	1	14	0
Texas:						
North Central Texas	29	1	20	50	410	477
West Texas	25	0	2	27	296	323
Texas Panhandle	8	0	0	8	79	103
Eastern Texas	20	1	3	24	188	140
Texas Gulf Coast	13	0	10	23	162	212
Southwest Texas	22	0	2	24	235	344
Total Texas	117	2	37	156	1,370	1,599
North Louisiana	7	1	3	11	100	95
Louisiana Gulf Coast	17	0	2	19	132	119
Total Louisiana	24	1	5	30	232	214
Arkansas	2	0	1	3	26	34
Mississippi	1	0	0	1	27	16
Montana	0	0	0	0	45	23
Wyoming	2	0	0	2	24	24
Colorado	0	0	0	0	5	5
New Mexico	3	0	0	3	50	113
California	15	0	2	17	185	169
Total United States	295	53	108	456	4,157	4,238
Total previous week	290	54	117	461		
Week ended Mar. 2, 1940	342	32	98	472		

Lisbon Deep Test Finds First Smackover Lime Production

By
GEORGE WEBER

SHREVEPORT, La., Mar. 3.—Wildcatting through the Wilcox sector of North Louisiana has increased again this week, and interest is heightened by the show of oil and gas in another wildcat. The deep Lisbon test is also commanding attention, as production tests are made on the Smackover lime. Cotton Valley and Dorcheat fields gained important extensions during the past week, as drilling in proven fields continues slack.

Smackover Lime Producer

North Louisiana had its first Smackover lime production this week after Union Production Co. 1-A Meadows, in Claiborne Parish, came in for 422 bbl. of condensate in 16 hours, gaged through ⅝-in. choke. Production is coming from perforations at 10,148-10,393 ft. The well is the deepest test ever drilled in North Louisiana.

Following a showing of a small amount of gas last week between 10,353 and 11,834 ft., operators plugged back to 10,441 ft. and perforated.

Wilcox play.—A total of eight wildcats are active this week in the Wilcox play, centered around La Salle Parish. Of these, two have shows, one in the top and the other deeper in the formation. Lion Oil Refining Co. 1 Goodpine, south of Urania, and on the extreme west edge of La Salle Parish, will test the top of the Wilcox which recently showed nine stands of oil cut with gas and mud and four stands of salt water on a drill-stem test. A string of 7-in. casing was set at 1,671 ft., after operators drilled to a total depth of 4,120 ft., without reporting further shows. The Olla zone in that test shaled up.

Northwest of Searcy, in western La Salle Parish, Placid Oil Co. reported gas sands at 2,660-70 ft., 2,980-90 ft. and 3,570-80 ft., with a slight show of oil. Five-inch casing was set at 3,980 ft. and perforations shot at 3,580-86 ft. After getting water, operators squeezed perforations and were last reported waiting on cement to retest. The level now being tested lies approximately 1,760 ft. below the top of the Wilcox.

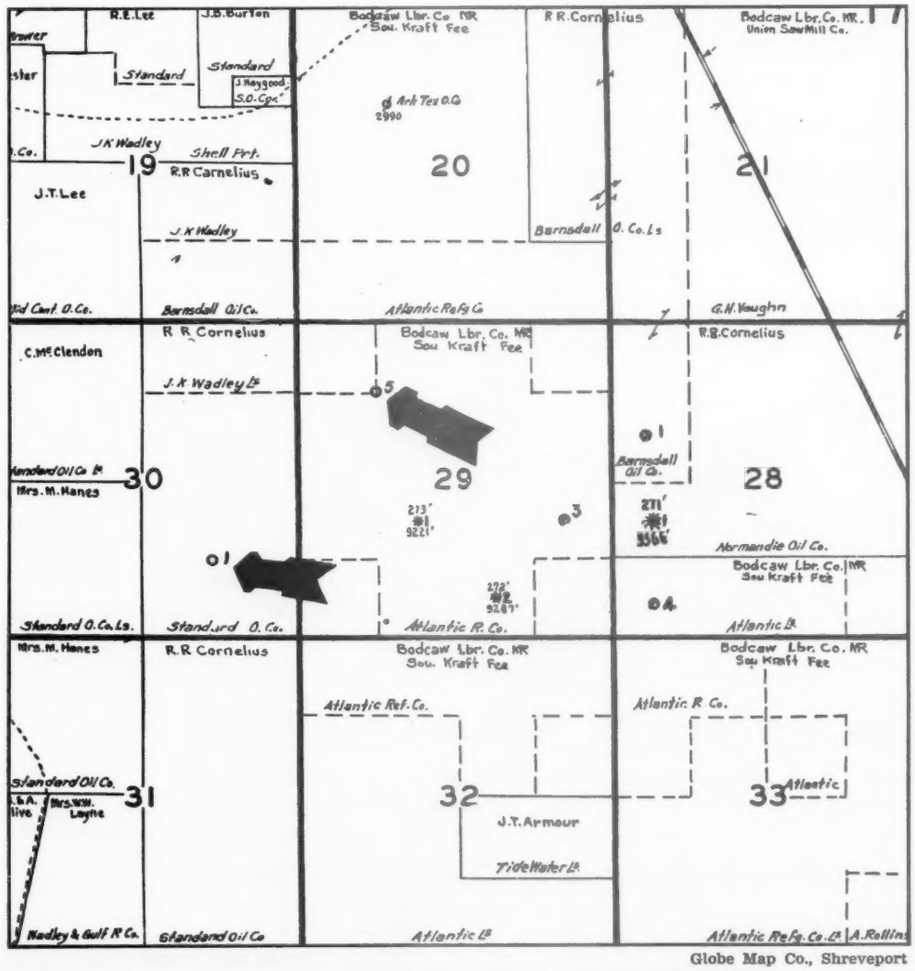
A deep Madison Parish wildcat was abandoned last week, H. L. Hunt 1 Lancaster, south of Tallulah and near the Mississippi River, total depth 6,725 ft., with no shows reported.

Cotton Valley.—Magnolia Petroleum Co. is nearing completion on 1 Pruitt, SE SE 7-21-9, located north and east of production. The "D" sand was missing, but Bodcaw oil sand was encountered at 8,589-8,633 ft., and production string has been set.

SUMMARY OF COMPLETIONS

	No.	Bbl.	Footage
North Louisiana			
Oil wells: Caddo	5	241	7,865
Homer	1	60	1,450
Olla	1	260	2,300
Gas wells: Sugar Creek	1	*14	5,820
Dry holes: Caddo	1	.....	1,665
Wildcats	2	.....	8,493
Total	11	.....	27,593
Arkansas			
Oil wells: Dorcheat	1	288	8,882
Smackover	1	65	2,548
Dry holes: Wildcats	1	.....	2,356
Total	3	.....	13,786
East Texas Border			
Oil wells: Smithland	1	36	2,295
Dry holes: Caddo	1	.....	1,410
Wildcats	2	.....	6,361
Total	4	.....	10,066

*Million cu. ft.



Globe Map Co., Shreveport

The McKamie field, Township 17s, Range 23w, Lafayette County, Arkansas, is being developed on a 160-acre spacing pattern. Following investigations which revealed that the production in the reservoir is in the gaseous phase, the Arkansas Oil and Gas Commission set wider spacing. Two locations, indicated by arrows, have been staked for quarter sections

NORTH LOUISIANA COMPLETIONS

Caddo—Caddo Parish

L. L. Lanier, Tr., 1 Spell ..... NE NE SE 12-20-16
Pumped 16 bbl., 7-in. casing, 1,408 ft., 4,000 gal. acid, T.D. 1,572 ft.

Magnolia 14 Herndon ..... NE SW 22-21-15
Pumped 150 bbl., 7-in. casing, 1,463 ft., 3,000 gal. acid, T.D. 1,590 ft.

P. D. & E. 2 Burton ..... NW SW NW 1-20-16
T.D. 1,665 ft., salt water, abandoned.

S. Reele 2 Ramsey ..... NE SE NE 32-21-15
Pumped 25 bbl., 4,000 gal. acid, T.D. 1,601 ft., 6⅝-in. casing 1,396 ft.

W. E. Stewart et al 1 Robertson ... SW SW SE 31-31-15
Pumped 30 bbl., T.D. 1,525 ft., 5½-in. casing 1,370 ft.

Weaver Perry 2 Pardue ..... NW NE NE 33-21-15
Pumped 20 bbl., T.D. 1,557 ft., 7-in. casing 1,402 ft., 4,000 gal. acid.

Wildcat—Catahoula Parish

Smith Bros. 1 Cernick ..... NW SW 29-11-8e
Location abandoned.

Homer—Claiborne Parish

Louark 38 Lowenberg .....
1,400 ft. W and E lines, 13 and 24-21-8
Pumped 60 bbl., T.D. 1,450 ft., 8⅝-in. casing 1,364 ft.

Sugar Creek—Claiborne Parish

Haynes B. Owenby 1-C Ozley ... NW NE SE 7-19-5w
14,000,000 cu. ft. gas, R.P. 1,585 lb., perf. 5,574-80 ft., 5½-in. casing 5,720 ft., T.D. 5,820 ft.

Olla—La Salle Parish

Ark. Fuel Oil 11-C Tremont ..... SE NE 3-9n-2e
260 bbl., 3 per cent salt water, T.P. 100 lb., C.P. 425 lb., 7-in. casing 2,297 ft., perf. 2,240-43 ft., T.D. 2,300 ft., Mathews sand.

Wildcat—Madison Parish

H. L. Hunt 1 Lancaster .....
385 ft. W, 340 ft. N, most easterly cor., 3-14-12e
T.D. 6,725 ft., dry.

Wildcat—Red River Parish

Spiers & Cummings 1 Paschal .... NE SE NE 11-14-11
T.D. 1,768 ft., salt water, dry.

ARKANSAS

Drilling continues slow in South Arkansas, with few rigs engaged in exploration. The deepest field in the state, Dorcheat, added another producer in Shell Oil Co., Inc., 2 Keith, which gauged 288 bbl. from the Smackover lime at 8,862-66 ft.

The deep test in the Stephens area of northern Columbia County, Crow Drilling Co. 1 Smart, is still shut down awaiting pump. In Union County C. H. Murphy is running 7-in. casing with total depth at 7,820 ft. The deep El Dorado field test is in the Smackover lime, topped at 7,707 ft. Sections of oolitic lime with oil, gas and sulfur odor have been cored below 7,697 ft. and testing this well will be watched with considerable interest.

ARKANSAS COMPLETIONS

Dorcheat—Columbia County

Shell Oil Co., Inc., 2 Keith ..... SW SE 9-18-22
(Continued on Page 80)

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A DIVISION OF GENERAL AMERICAN TRANSPORTATION COMPANY

By

ROBERT INGRAM

Daily-Allowable Hike Points To Early Gain in Drilling

INCREASING demand for Kansas petroleum, reflected by the March crude-oil allowable as set by the state Corporation Commission, pointed to an early gain in the number of drilling operations which this week were holding about steady. The daily production total for the state was up 2,000 bbl. from February to a total of 198,200 bbl.

SUMMARY OF COMPLETIONS

	No.	Bbl.	Footage
Oil wells: Bemis-Shutts	2	3,180	6,892
Hall-Gurney	2	1,543	6,095
Trapp	1	3,000	3,345
Other fields	16	2,490	47,156
Dry holes: Fields	5	.....	15,244
Wildcats	4	.....	11,124
Total	30	.....	89,856

The allowable was set on the basis of the Bureau of Mines estimate of 194,200 bbl. daily. plus an additional 4,000 bbl. for new wells to be completed during the month (see Page 20).

Hall-Gurney.—Meantime, Shell Oil Co., Inc., extended the Hall-Gurney pool of southern Russell County ¾ mile to the east in 1 Ruby, NW NE 36-14-13w. The well drew an initial potential of 183 bbl. a day, based on a swab test of 174 bbl. of oil and 33 bbl. of basic sediment and water produced in 2 hour and 45 minutes after acid treatment. The well has been assigned to the Hall-Gurney pool and is productive from the Lansing-Kansas City lime series.

AVERAGE DAILY PRODUCTION

LEADING KANSAS FIELDS

	Week ending Mar. 1	Week ending Feb. 22
Augusta	1,200	1,250
Bemis-Shutts	10,700	8,100
Bloomer	4,700	5,500
Burnett	6,350	6,200
Burrton	7,900	7,700
Chase	5,000	5,200
Elbing	1,200	1,200
El Dorado-Towanda	7,200	7,250
Geneseo	4,100	4,250
Graber	2,650	2,450
Greenwood County	8,600	8,550
Hollow-Nikkel	1,500	1,450
Keesling	950	750
Lerado	600	500
Lorraine	1,250	1,400
Oxford	700	700
Rainbow Bend	950	950
Raymond	1,250	1,350
Ritz-Canton	4,000	3,850
Trapp	17,000	16,800
Balance Russell County	19,700	21,750
Sedgwick County	3,250	3,150
Voshell	1,750	1,750
Silica	16,750	19,300
Wellington	1,100	1,050
Wherry	3,300	4,250
Zenith	7,200	7,100
Others	61,700	63,350
Total	202,550	207,100

Originally the test was drilled to a total depth of 3,219 ft. in the Arbuckle dolomite, topping the Sooy conglomerate at 3,106 ft. and the Arbuckle at 3,120 ft. Operators failed to develop production in the Arbuckle and plugged back to 2,910 ft. in the Lansing series.

In Stafford County, a promising wildcat, Atlantic Refining Co., Alf M. Landon et al 1 Shaffer, W½ NW SW 3-21-13w, failed to make much of a showing after treatment with 4,000 gal. of acid. Operators will shoot the well with nitroglycerin and reacidize. The test is 2½ miles southeast of production in the Hiss pool.

Seven New Wildcats Reported

Among new wildcats reported during the week were:

Derby Oil Co. and Lario Oil & Gas Co. 1 Dick, W½ SW NE 21-20-9w, ¾ mile southwest of the Keesling pool, and Simpson Oil Co. 1 Bernstorf, S½ SE SW 15-19-10w, 1½ miles north of the Silica pool, both in Rice County.

Cowley County.—Trees Oil Co., Winfield, 1 Rhodes, NW SW SE 13-31-4e, 1¾ miles southeast of the Sherwood pool.

Rooks County.—Ruso Drilling Co., Tulsa, 1 Dick CWL NW SW 21-10-19w, 2½ miles northwest of the Zurich pool.

Sedgwick County.—Aylward Production Co., Wichita, 1 fee, CEL SE SW 35-27-2e, 1½ miles west of the Andover pool.

Stafford County.—Stanolind Oil & Gas Co. 1 Naegel C E½ NE SW 3-24-15w, some 10 miles northwest of the Jordan pool and 9 miles west and north of the Rattlesnake pool.

Barton County.—Stanolind Oil & Gas Co. 1 Zugg, in the C E½ SE NW 35-16-13w, a semiwildcat east of the Ainsworth pool.

KANSAS COMPLETIONS

Barton County

Feltes pool: Black-Marshall 1 Weber, W½ SW SW 12-16-12w, dry, T.D. 3,384 ft., some show oil 3,357-59 ft. and 3,361 ft.

Butler County

Augusta pool: Cities Service 33 Varner, SE NW NE 17-28-4e, pumped 40 bbl., Kansas City lime 1,998-2,011 ft.
Cities Service 15 Miller, NW SE SW 2-28-4e, pumped 17 bbl., Kansas City 2,056-95 ft.
Sid Neff 1 King, NW SW NE 2-28-4e, pumped 25 bbl., Kansas City 2,056-95 ft.
El Dorado pool: Cities Service 196 Wilson, SW SW NW 9-25-5e, pumped 41 bbl., Kansas City 1,976-2,001 ft.
Potwin pool: Ramsey 1-A Joseph, NW NW SE 25-24-3, pumped 75 bbl., Mississippi lime 2,505-27 ft.

Cowley County

David, South: Brewer 3 David, E½ NW NE 2-31-4e, dry, T.D. 3,025 ft., Mississippi lime, 3,021 ft.
Wildcat: Dan Young 1 Lantz, NE NW SW 14-34-3e, dry, T.D. 500 ft.

Ellis County

Bemis-Shutts: Champlin Refining 5-D Hadley, N½ SW SE 17-11-17w, 3,000 bbl., Arbuckle 3,368-82 ft.
Cities Service 2-A Collahan, SE SW NE 24-11-17w, swabbed 180 bbl., Arbuckle 3,395-3,400 ft.
Herzog pool: Gulf and Gled Oil 2 Sander, S½ SW SE 30-13-16w, pumped 46 bbl., Arbuckle 3,468-84 ft.

Ellsworth County

Edwards pool: Continental et al 7 Rolfs, N½ N½ NE 28-17-8w, pumped 308 bbl., Arbuckle 3,211-42 ft.

Graham County

Wildcat: Gulf 1 Boller, E½ SE SE 29-7-22w, dry, T.D. 3,901 ft., show black oil 3,858 ft., Topeka, 3,272 ft., Lansing 3,520 ft., base Kansas City 3,718 ft., Arbuckle 3,837 ft.
Ewers-Simpson et al 1 Bundy, SW SW 12-9-22w, dry, T.D. 3,899 ft., at 3,879 ft. swabbed 110 bbl. water and 43 bbl. oil in 17 hr., Lansing 3,564 ft., Arbuckle 3,869 ft.

Greenwood County

Virgil pool: Rhodes & Dougherty 8 Bays, SE NW SE 17-23-13e, dry, T.D. 1,862 ft., Mississippi lime 1,781 ft.
Demalorei-Sowder: Phillips 79 Shepard, NW NE NW 11-22-10e, pumped 117 bbl., T.D. 2,159 ft.

McPherson County

Canton, North: Johnson & Cunningham 1-A Keefer, NW SW SW 25-18-1w, pumped 45 bbl., Mississippi lime 2,800-32 ft.
Wildcat: Westgate-Greenland 1 Bukey, S½ SE NW 17-18-1w, dry, T.D. 2,888 ft., some show oil 2,832 ft., Topeka 1,670 ft., Lansing 2,225 ft., conglomerate 2,825 ft., Mississippi lime 2,832 ft.

Pratt County

Cunningham pool: Skelly 3 Lakin, E½ NE NE 36-27-11w, flowed 792 bbl., Lansing 3,441-3,504 ft.

Rice County

Geneseo pool: Continental 7 Meyer, NW SW SW 30-18-7w, pumped 210 bbl., Simpson sand 3,148-3,220 ft., T.D. 3,251 ft.
Continental 5 Powell, NE NW NW 31-18-7w, swabbed 165 bbl. in 4½ hr., Simpson sand 3,226-30 ft.
Orth, East: Transwestern 1 Roelfs, S½ NE NE 26-18-10w, swabbed 106 bbl. in 2 hr., quartzite 3,175-3,221 ft.
I. W. Murfin et al 1 Elwell, NW NW NW 36-18-10w, dry, T.D. 3,412 ft., Lansing 2,900 ft., Arbuckle 3,271 ft., Sooy 3,245 ft.
Wherry pool: W. L. Hartman 1 Dresback, E½ SE NE 7-21-6w, dry, T.D. 3,561 ft., Topeka 2,564 ft., Lansing 2,962 ft., Sooy 3,510 ft., Mississippi 3,517 ft.

Russell County

Trapp pool: Leader Oil 3 Hinderliter, SE SW NW 33-15-13w, 3,000 bbl., Arbuckle 3,342-45 ft.
Hall Gurney pool: Coralena 4 Phinney, S½ SW NE 30-14-13w, pumped 908 bbl. in 8 hr., Lansing 2,877-2,987 ft.
Helmerich & Payne 5 Boxberger, NW NW NE 21-14-14w, pumped and flowed 635 bbl. in 8 hr., Lansing 3,006-3,108 ft.

Stafford County

Stafford pool: Stanolind 3 Charles, S½ NE SE 15-24-12w, flowed 155 bbl. in 3 hr., Viola 3,810-29 ft.
Stanolind 2 Crawford, SW NE 15-24-12w, flowed 287 bbl., Viola 3,819-29 ft., T.D. 3,847 ft.
Zenith pool: W. E. Porter 1-A Richardson, E½ SE SW 10-24-11w, flowed 61 bbl. an hr. for 3 hr., Viola 3,812-28 ft.

KANSAS DRILLING REPORT

Barton County

Isern Bros. 1 Lillard ..... W½ SW SE 6-16s-11w
P.B. 3,268 ft., 4 gal. oil in 3 hr.
Republic Nat. Gas 1 Radenberg W½ NW SE 8-17s-11w
Drilling 2,698 ft.

Butler County

Rex & Morris 2 Matthew ..... NE SE NW 26-28s-6e
First report.

Cowley County

Sinclair Prairie 1 Gibson ..... SE SE NW 29-34s-3e
Set 50 ft. of perf. liner 3,378 ft., est. 40 bbl. oil a day.

Elk County

McPherson et al 1 Clogson ..... SW SE SE 21-28s-11e
Drilling 300 ft.
McPherson et al 1 Batesman .. SW SE NW 24-28s-11e
S.D. 250 ft.

Ellsworth County

Pryor & Lockhart et al 1 Weisenthal .....
SW SE NE 30-15s-10w
Lansing 2,900 ft., 8-in. 2,770 ft., 1½ bbl. water 3,000-10 ft., 7-in. 3,060 ft., drilling 3,070 ft.

Jefferson County

McCain & Sherrod 1 Green ... SW SW NW 9-11s-19e
Underreaming 6-in. 1,537 ft.

Kearney County

Stanolind 1 Billinger ..... E½ SE SW 5-21s-38w
Building rig.

Marion County

Rex & Morris 1 Kappan .... N½ NW NE 16-18s-4e
12-in. 980 ft., drilling 1,175 ft.

Nemaha County

A. C. Bumpus et al 1 Achten .. S½ SE NW 12-4s-14e
Cleaning out 2,077 ft.

Pratt County

Stanolind 1 Hartsell ..... E½ NW NE 3-26s-12w
Anhydrite 688 ft., drilling 3,790 ft.

Reno County

Bay Pet. 1 Woodson ..... E½ NE NW 28-26s-9w
Anhydrite 310 ft., Ft. Riley 1,635 ft., Lansing 3,390 ft., drilling 3,949 ft.
R. E. Hess & Son 1 McKee .... E½ NE SE 8-22s-8w
Underreaming 8-in. 2,555 ft.

Rice County

Earl Wakefield et al 1 Smyres . N½ NE SE 35-19s-6w
Set 8-in. 121 ft., drilling 1,405 ft.
Sharon Drlg. et al 1 Nevious SW SW NE 21-19s-10w
Topeka 2,550 ft., Lansing 2,963 ft., show oil 3,030-50 ft., Arbuckle 3,273½ ft., show oil, running casing.

Russell County

Central Pet. 1 Zeman ..... SW SW NE 16-15s-12w
Anhydrite 731 ft., Ft. Riley 1,660 ft., drilling 1,735 ft.
Earl Wakefield 1 Holland .... E½ NE SE 30-13s-13w
Show oil 3,080 ft., 1 bbl. water 3,080-90 ft., H.F.W. 3,105-10 ft., 6-in. 3,110 ft., cleaning out.
Shell Oil 1 Ruby ..... NW NW NE 36-14s-13w
Top plug 2,901 ft., perf. 2,848-57 ft., bailed 1 bbl. oil and ⅛ bbl. water an hr., perf. 2,836-40 ft., bailed 1 bbl. oil and 1 bbl. water an hr., 6,000 gal. acid, flowed 2½ hr. into pits, swabbed and flowed 174 bbl. oil and 33 bbl. b.s. and w. in 2¾ hr.

Sedgwick County

Aylward Prod. 1 Aylward .... E½ SE SW 35-27s-2e
First report.

Stafford County

Stanolind 1 Nagel ..... E½ NE SW 3-24s-15w
Rigging up rotary.

FOREST CITY BASIN

ST. JOSEPH, Mo., Mar. 3.—The Indian Territory Illuminating Oil Co. was building tanks preparatory to a production test at 1 Mary Schaible, new producer in C SW SW 29-3n-16e, Richardson County, the thirty-fifth well of the county and the first extension to the Shubert pool. It was drilled by the Lee Drilling Co. and it produced at the rate of 360 bbl. daily after acidization with 1,000 gal. Hunton pay lime was topped at 2,462 ft. and drilled to 2,476½ ft.

Other activity in that vicinity was 2¾ miles southeast of Shubert, where Garetson & Knisely were going back to complete 1 J. S. Parsons, which they spudded back in January in SW SW 30-3n-16e. They moved off following spudding to complete another job.

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1240-SS—140,000 lbs.

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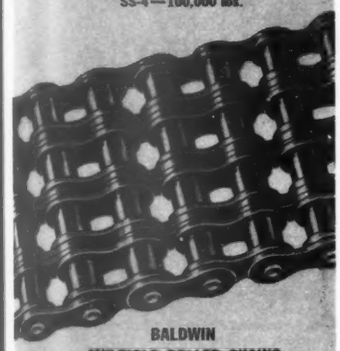

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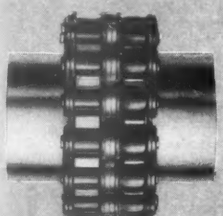

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BALDWIN CHAINS TRANSMIT ALL THE POWER

By
ROBERT INGRAM

Good Strike in Logan County Highlights Busy Week

THERE was a new bustle in oil circles this week, traceable to several important developments which broke in swift succession. First, and most spectacular was the opening of an important new pool in Logan County, north and east of the town of Guthrie, at Sunray et al 1 Donoghue. After more than 2 weeks of waiting for operators to set casing and test second Wilcox sand, which was topped at 5,420 ft., scouts and other interested parties who slogged through several miles of mud to be on hand were rewarded late in the week with a gush of mud, water, and light-green oil which flowed over the top of the derrick.

The well cleaned itself out and was allowed to flow for about 5 minutes. Then it was shut in for tankage. No attempt was made to gage the flow or to determine the gravity of the oil, but estimates ran freely from 1,000 to 5,000 bbl. a day as the potential production of the new well. Gravity was said to be about 42.

Attention had centered on the well even before it had penetrated and cored the second Wilcox because of the thinning of higher formations on the structure, particularly the Mississippi lime which showed only 14 ft. in thickness. When only 40 ft. of dolomite was found between the first and second Wilcox sands, trading began in earnest. Continental Oil Co. bought out the quarter interest in the well held by E. W. Hamilton and J. P. Cullinan, both of Tulsa, and also their interest in surrounding acreage. By the time the pipe was set and operators were ready to drill the plug for a test, virtually all the acreage covering the expected structure had been leased by operating companies. (See The Oil and Gas Journal, February 27, 1941.) The discovery well is located in NW SE 7-17-1w.

SUMMARY OF COMPLETIONS

	No.	Bbl.	Footage
Oil wells: Dill	3	1,116	10,959
St. Louis	2	1,543	8,230
Other fields	5	3,960	18,609
Gas wells: Fields	3	*19.3	9,872
Dry holes: Fields	5	.....	15,178
Wildcats	6	.....	19,025
Total	24	.....	81,873
Recompletions	1	13	.....

*Million cu. ft.

New Cycle Looms for Oklahoma City

At the same time the 1 Donoghue was being brought in, Oklahoma City operators had a flurry of excitement over the distribution among state legislators and oil men of a proposed bill which would authorize the state Corporation Commission to organize secondary recovery units. Coming as it did after more than 2 years of exhaustive engineering and legal research, it was hailed as the beginning of a new phase in the development of the Oklahoma City pool.

Reflecting the flurry caused by opening of the drive to unitize the field so that secondary recovery methods could be applied, applications for permits to drill nine oil wells were made ready to be presented to the city adjustment board. This was the largest number heard at one meeting since boom days of the city oil field. Most of the recent drilling has been low on the west edge of the pool where the highly productive Wilcox sand is thickest.

At the same time, individuals who had access to the highly confidential engineering report prepared for the secondary recovery committee (see p. 15) were predicting that innovations in producing equipment would be introduced throughout the field in a short time.

Recycling Plant Proposed

Another proposed unitization plan revealed last week attracted considerable attention, largely because of the area involved and the nature of the project under consideration. A communitizing agreement was presented to the School Land Commission by the Magnolia Petroleum Co.'s Oklahoma manager, Louis Campbell, which would apply to an undeveloped 9,600 acres in Dewey County in the western part of the state. If and when the agreement becomes effective (see p. 28) Magnolia proposes to develop the area with the view of building a recycling project, the first in the state.

The part of the state in which the project is proposed has held the eye of operators for several years, and has been tested in the past 2 years by Phillips Petroleum Co., Anderson-Prichard Oil Corp., Magnolia and Gulf Oil Corp. which completed a dry hole in Woods County, 1 Hess, NE NW 33-23-13w, this month. (See The Oil and Gas Journal, February 13, 1941.)

Magnolia's test, 1 Fieken, SW SW 31-18-14w, is in the heart of the lease block included in the proposed communitizing plan. It was junked last July at a total depth of 9,475 ft. with casing parted in the hole, but a large volume of gas in the 9,400-ft. zone had been struck. On the strength of the gas showing, and also of the fact that the Anderson-Prichard test in 15-18-9w, 25 miles away, found a small volume of very wet gas, Magnolia officials said they believed the area to be suitable to a recycling operation.

They pointed, however, to a condition which has delayed development of western Oklahoma this long—the high cost of drilling to productive formations which are found at from 9,000 to 10,000 ft. The cost of drilling in this area, Magnolia told the commission, was from $150,000 to $200,000 per well. Nonetheless, and in spite of the fact that Magnolia conceded it would be a matter of years before their plan could be effected, the time seemed to be at hand when it would be profitable to explore the area further.

Gusher Opens New Seminole Pool

And as a fitting climax to a busy week, new operations reported during the week rose to 50, a high for the year, and C. C. Cummings and Sunset Oil Co. opened a new Hunton lime pool east of the Seminole pool of Seminole County with 1 Brown, SW SE SE 14-9-7e. The new well was plugged back from the Wilcox, which had water, and perforated in the Misener sand from 4,050-60 ft. and the Hunton from 4,080-4,106 ft. After acid treatment, the well came in with an estimated 15,000,000 cu. ft. of gas and an estimated 30 bbl. of oil an hour. It blew the tools out of the hole. The 1 Brown is located ¼ mile north of a dry Wilcox test recently drilled by the Amerada Petroleum Corp. which did not test a show in the Hunton lime and ran about 50 ft. lower.

OKLAHOMA COMPLETIONS

Caddo County

Cement pool: Olson 3 Rigney, NE SE NW 12-5-9w, est. 2,000,000 cu. ft. gas and 1 bbl. oil, perf. 3,245-72 ft., show oil 3,340-64 ft., T.D.

Carter County

Hewitt pool: Jones 4 Griffin, N½ NW NW 26-4s-2w, pumped 15 bbl., T.D. 2,321 ft., casing 2,285 ft.

Creek County

North Bristow: Tilley 7 Wright, SW SE NE 17-17-8, dry, T.D. 2,417 ft., Prue 2,352 ft.

Kay County

Wildcat: Continental 1 Bronan, NW NE SW 23-28-3, dry, T.D. 3,176 ft., oil show in Skinner 2,955-84 ft.

Lincoln County

Prague pool: Mid-States 3-A Provaznik, NW SW SW 33-12-6, pumped 135 bbl., casing 3,265 ft., T.D. 3,305 ft.
Wilzetta pool: Morgan Gulf 2 Rulac, S½ SW NW 2-12-5, pumped 120 bbl., dolomite 4,505 ft., acid.
Wildcat: Mid-Continent 1 School Land, NW NE NW 36-12-3, dry, T.D. 5,534 ft., dolomite 5,495 ft.

Logan County

Wildcat: Buckner 1 Foster, NE SE 17-9-2w, T.D. 802 ft., dry.

Noble County

Billings pool: Tide Water 2 Derr, SE SW NW 16-23-2w, dry, T.D. 4,336 ft., second Wilcox 4,320-36 ft.

Okfuskee County

Dill pool: Droppleman 8-C Dill, NW SE SE 34-12-8, flowed 528 bbl., Cromwell 3,554 ft., T.D. 3,590 ft.
Phillips 2 Miller, NE NE 34-12-8, flowed 288 bbl. in 17 hr., Cromwell 3,659 ft., T.D. 3,699 ft.
Seran 2 Roberts, NW SE NE 34-12-8, flowed 300 bbl., Cromwell 3,629-68 ft., T.D. 3,670 ft.
Wildcat: Pioneer 1 Hinkle, NE NW SE 5-11-10, dry, T.D. 3,696 ft., Hunton 3,664 ft.

Pawnee County

Teriton area: Grieves 1 Armstrong, SW SE NW 23-20-7, 2,250,000 cu. ft. gas, casing 2,614 ft., broken sand 2,622-30 ft., Bartlesville 2,630-38 ft.

Pontotoc County

West Francis pool: Norville 1 Shoup, SW SW 24-5-6, 15,000,000 cu. ft. gas and show oil, sand 1,872-82 ft., casing 1,870 ft.

Pottawatomie County

St. Louis district: W. Smith 1 Wimbs, NE NE 7-7-4, flowed 374 bbl., Hunton 3,967 ft., casing 3,973 ft., T.D. 4,007 ft., acid.
Gulf 8 Green, NW NE SE 17-7-4, swabbed 1,169 bbl. in 20 hr., first Wilcox 4,218 ft., second Wilcox 4,222-23 ft., T.D.
Magnolia 3 Walker-Hilton, SW SE 21-7-4, old well drilled deeper from 4,158 ft. to Wilcox 4,302-13 ft., pumped 13 bbl.
Wildcat: O'Conner 2 Lynn, NE NW 28-6-4, dry, T.D. 3,717 ft., Viola 3,588 ft., dense 3,650 ft., dolomite 3,685 ft. and 3,711-17 ft.

Seminole County

Cromwell pool: Reese 2 Replogle, NW NE NE 2-10-8, flowed 385 bbl., Cromwell 3,466-87 ft., T.D.
Hazel pool: Villenes 2 Swan, NW NE 26-7-5, dry, T.D. 3,096 ft., Earlsboro 3,081-96 ft.
Seminole pool: Harnsberger 1 Wilson, SW SE 36-9-6, temporarily abandoned, T.D. 85 ft.

Tillman County

Frederick pool: I. T. I. O. 2 Fillmore, S½ S½ SE 36-2s-19w, dry, T.D. 5,244 ft., Arbuckle 5,228 ft., 577 bbl. water an hour, P.B. 5,172 ft., swabbed 20 bbl. water.
I. T. I. O. 6 Dickey, N½ N½ NW 1-3s-19w, flowed 3,305 bbl., Arbuckle 4,974 ft., T.D. 4,991 ft.
Wildcat: Staley 2 Staley, SW SE NW 10-2s-19w, dry, T.D. 2,100 ft.

OKLAHOMA DRILLING REPORT

Beckham County

H. C. McLaughlin 1 Stain.....SW SW 25-8n-25w
First report.

Comanche County

Hamblen-Good 1 Phillips.....NE NE NW 34-1n-13w
S.D. 441 ft.

Hughes County

Magnolia 1 McKoy heirs.....SW SW SE 16-5n-11e
P.B. 5,773 ft., D.S. test 5,630-5,773 ft., open 1 hr., received 450 ft. mud, no gas or oil, D.S. test 5,517-5,773 ft., open 1 hr., received 475 ft. mud, no oil or gas shows, setting plug to perf. in casing.

Jackson County

Mutual Oil 1 A. Caves SW NW NW cor. NW 36-4n-21w
Granite wash 1,070-90 ft., show oil, T.D. 1,093 ft., 7-in. 1,070 ft., testing, showing little gas.

Jefferson County

Hampton-Stelley 1 Pealor.....NW NE NW 33-7s-6w
Dry sand 2,730-64 ft., liner 2,868-82 ft., drilling 2,952 ft. in red bed shale.

Love County

Colvin & Hichs 2 Westheimer & Daube.....
W½ SE SW 27-6s-2e
T.D. 3,022 ft., 3,000 gal. acid, no results, to shoot and reacidize.

Okfuskee County

K. G. F. F. 1 Camp.....SW SW SW 6-11n-9e
Oswego 1,668 ft., Calvin 1,730 ft., Henryetta coal 2,105 ft., Senora lime 2,200 ft., Allen sand 2,215 ft., drilling 2,650 ft.
Burke-Greis 1 Mullins.....SW SE SE 5-10n-10e
T.D. 3,366 ft., water, to P.B. and test Gilcrease.

Oklahoma County

Clyde Dorr et al 1 Riley.....NE NE SE 34-13n-1e
Drilling 4,217 ft.

Pottawatomie County

Grisso & Eason 1 Rayster.....SW NW NW 33-6n-3e
Perf. 2,862-74 ft., gas and show oil 2,862 ft., H.F.W., squeezed.

Seminole County

Weldon Hall 1-A Jackson.....N½ NE SE 14-7n-7e
T.D. 3,192 ft., pumped 44 bbl. in 24 hr., testing.
Mico O. & G. 1 Davis.....NE NE NE 33-10n-8e
Drilling 1,170 ft.
Selboldt Drlg. 1 Boren.....SW SE SW 34-6n-6e
First report.

Stephens County

Helmerich & Payne 1 Cryer....SE NE SW 33-2n-5w
First report.
Gulf Oil 1 Krieger.....E½ NE SW 3-2n-5w
Cored for dip 5,640-45 ft., received 5½ ft. hard silty lime, dip 48°, drilling 5,658 ft.

K. M. A. Ellenburger Pay Is Proving of Major Importance

By R. MARNE SANFORD

WICHITA FALLS, Tex., Mar. 3.—The deep Ellenburger lime pay in the K.M.A. field in Wichita, Archer, and Wilbarger counties was discovered more than a year ago. At that time it offered little more than a secondary objective to operators, but it is now rapidly attaining major importance as an oil reserve.

At the present time there are six producing wells in the Ellenburger pay in the field. Actually seven have reached the pay but one was plugged back to the regular K.M.A. lime for completion after an excess of water was found in the lower pay. The six producing wells have proven some 1,000 acres in a narrow strip through the southwestern part of the regular K.M.A. field. The latest completion is Fain-McGaha Oil 3-E Griffin, just southeast of its 2-E Griffin, and approximately midway between the northwest and southeast outpost producers of the area. The test encountered slight shows of oil in the regular K.M.A. pay level from 3,771-3,811 ft. and from 3,824-27 ft., however, it was drilled deeper and 7-in. casing was cemented at 4,308 ft. The Ellenburger lime was topped at 4,315 ft. with saturation from 4,318-26 ft., total depth. Official gage has not yet been reported, but it is expected to be as good as its northwest offset which made 49 bbl. in 1 hour from pay only slightly higher structurally, or from 4,298 to 4,322 ft.

Another recent completion is Phillips and Shell 20-E Griffin, in the Jordan Survey and about a mile north of the two Fain-McGaha wells. It made 43 bbl. of oil in 1½ hours from pay at 4,250-4,400 ft., which was lower in the section, although only slightly lower structurally. The discovery well was Fain-McGaha Oil 16-E Griffin, later changed to 1-Elb. Griffin, in the southeast corner of the Griffin "B" lease of the W. H. Spillers Survey, in the approximate center of the now proven field. It was completed for 339 bbl. of oil in 3 hours from pay drilled from 4,352-89 ft.

Newest extension is to the northwest about a mile from Phillips and Shell 20 Griffin. It is Phillips and Shell 14-A D. R. Preston, Section 20, Block 7, H.&T.C. Survey. Ellenburger lime was topped at 4,460 ft. and drilled with saturation from 4,476 to 4,503 ft., total depth. A 15-minute formation test netted a drill stem full of oil and casing has been set for official completion this week.

Only a few weeks following the completion of the discovery deep producer in April of 1940, Magnolia drilled 3 Thom, southeast part of the Spiller Survey and about 1¾ miles southeast of the discovery, into saturation in the Ellenburger lime at 4,419 ft. and penetrated it to 4,423 ft. The well tested about 60 bbl. of oil and 300 bbl. of water daily, being some 100 ft. low, structurally, and was plugged back for final completion from the regular K.M.A. pay level. Magnolia 4 Thom, just northwest of 3 Thom, however, made a well in the deep level.

At present two tests are preparing to start, projected to the deep pay. These are Fain-McGaha 1-Elb.-A Griffin, and 2-Elb.-A Griffin, both just south of the discovery well.

This deep level is expected to receive considerable drilling during the coming months, as the regular K.M.A. lime pay has proven rather barren in this southwest corner of the field. Few other wells in the field and especially in this sector have been carried to the Ellenburger lime, thus little is known, geologically, of the size of the deep-seated structure which is responsible for the Ellenburger lime production. The present trend of the field (two of the southernmost wells being in extreme northern Archer County) is in a northwest-southeast direction and the structure is thought to be a secondary fold perpendicular to the one through the Hull-Silk field of Archer County to the southeast.

SUMMARY OF COMPLETIONS

North Texas

	No.	Bbl.	Footage
Oil: Archer field	2	278	1,986
Hull-Silk field	3	1,126	13,560
Clay field	4	99	3,710
Walnut Bend field	2	432	9,564
Voth field	2	336	2,632
Wichita field	3	112	3,349
Olney field	2	51	1,859
Other fields	6	1,067	15,775
Dry: Archer field	4	.....	4,596
Other fields	6	.....	6,579
Wildcats	6	.....	24,126
Total	40	.....	87,736
Old wells drilled deeper: Oil	1	72	.....
Dry	1	.....	.....

West Central Texas

Oil: Jones County	2	369	3,978
Cook field	1	95	1,697
Other fields	2	113	3,493
Gas: Hendrick field	1	*2.5	1,621
Dry: Fields	1	.....	1,260
Wildcats	3	.....	8,920
Total	10	.....	20,969

*Million cu. ft.

NORTH TEXAS COMPLETIONS

Archer County

Archer field: Rathke Oil 2 Cowan, dry at 1,104 ft.
W. T. Hutchinson 1 Ikard, dry at 1,351 ft.
Roy H. King 2 Stinnett A, 10 bbl. daily, pumping, 710-29 ft.
Fish & Fish 1 Prideaux, dry at 852 ft.
Petroleum Producers 1 King, 268 bbl. daily, natural, 1,235-57 ft.
Underwood Drilling Co. 1 Kunkel, dry at 1,289 ft.
K.M.A. field: A. R. Dillard 13 Kemp & Kempner, top gray lime 4,407 ft., top dolomite 4,622 ft., dry at 4,629 ft.
Hull-Silk field: Ligon and Deep Oil Development 7 J. T. Moss A, 26 bbl. an hour, open tubing, 4,288-4,340 ft.
Ligon 3 White C, abandoned location.
Ligon 10 White C, abandoned location.
Ligon 6 White E, abandoned location.
Helmerich & Payne 1 Wilson A, 66 bbl. an hour, ¾-in. choke, 500 gal. acid, Caddo lime, 4,611-24 ft.
Peterson & McCarthy 40 Wilson, 74 bbl. in 3 hr., ⅝-in. choke, 7,500 gal. acid, 4,590-96 ft., Caddo lime.
Wildcat: Shappell Oil 15 Lyles, top Caddo 4,830 ft., no shows, dry at 4,875 ft., located Sec. 7, Hooper & Wade Sur., Abst. 234.
H. F. Smiley 1 Tarr, dry at 1,400 ft., located Sec. 136, H.S. of C.R. Sur.

Baylor County

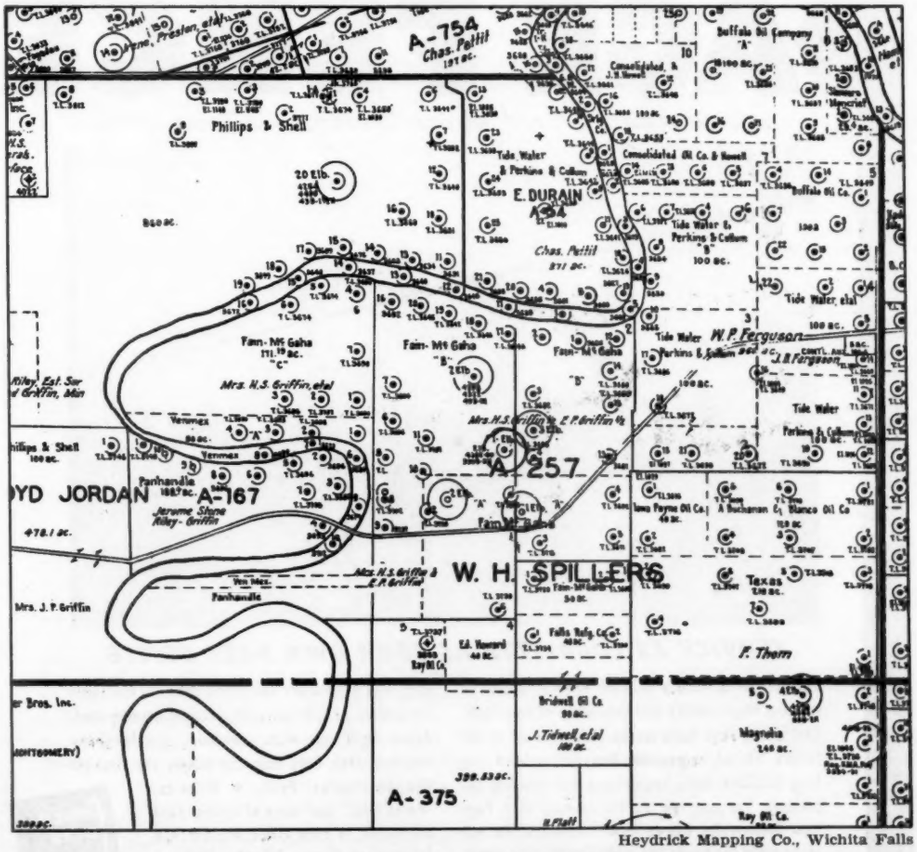
Wildcat extension to Seymour field: British American 1 Cowan, 58 bbl. oil and 500 bbl. water, pumping, 2,531-42 ft., P.B. from 2,547 ft., located Sec. 102, T.&N.O. Sur., Abst. 1311.

Clay County

Clay field: Akin, Dimock & Costley 2 Patrick, dry at 1,341 ft.
Sussex Oil 1 McInnis, 10 bbl. daily, pumping, 1,232-44 ft.
Sussex Oil 20 Glasgow, 10 bbl. daily, pumping, 1,070-90 ft.
Duncan, Arnold & Duncan 20 Duncan, 76 bbl. daily, pumping 1,183-98 ft.
Metzner & Burns 26 Thornberry, 3 bbl. daily, pumping, 166-78 ft.
Antelope field: Shell 3 Henderson, abandoned location.
Shell 6 Henderson, abandoned location.
Shell 6 Coburn, 184 bbl. in 8 hr., open tubing, natural, 3,177-3,239 ft.

Cooke County

Walnut Bend field: Sinclair Prairie 6 Ramsey, 164 bbl.



Heydrick Mapping Co., Wichita Falls

Almost overshadowed by the widespread deep wildcat play throughout North Texas in recent months is the K.M.A. field's deep Ordovician producing level. The area now boasts six producing wells (shown in large circles) and a proven area of about 1,000 acres. Two new wells are preparing to start and the entire deep area is scheduled for mounting development during the coming months

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daily, open tubing, natural, 4,826-40 ft.
Magnolia 12 Ramsey, 268 bbl. daily, pumping, natural, 4,701-24 ft.
Voth field: Humble 10 Heilman, 97 bbl. in 8 hr., pumping, natural, 1,276-1,303 ft.
Humble 11 Heilman, 45 bbl. in 8 hr., pumping, natural, 1,305-29 ft.
Wildcat: Bridwell Oil 1 Joe Fisher A, top Ellenburger lime 1,984 ft., dry at 2,013 ft.

Denton County

Wildcat: Amon G. Carter 1 Allen Bros., top Caddo 7,650 ft., top Viola 8,125 ft., top Ellenburger 8,778 ft., dry at 9,025 ft., located Stephen Westbrook Sur., Abst. 1337.

Jack County

Wildcat: Noah Davis 1 Rankin, Sec. 2555, T.E.&L. Sur., abandoned location.
Jack field: B. C. Gilmore 1 Wright, dry at 775 ft.
Bryson field: Trentman, Nunnelee & Showers 4 Owen, 324 bbl. daily, pumping, 3,100-17 ft.

Montague County

Nocona field: Claymont Oil 6 Bouldin, 10 bbl. daily, pumping, 20-qt. shot, 811-22 ft.
George G. Golden 1 Maddox, dry at 885 ft.
Wildcat: Sinclair Prairie 1 Hawkins, top Caddo 5,606 ft., top Ellenburger 5,905 ft., dry at 5,910 ft., located Sec. 17, Lot 49, H.&T.C. Sur.

Throckmorton County

Throckmorton field: Neustadt & McKelchan, dry at 860 ft.

Wichita County

Wichita field: Akin, Dimock & Costley 1 Dodson A, 30 bbl. daily, pumping, 1,314-30 ft.
W. E. Prod. 3 Glass, 77 bbl. daily, pumping, 1,307-29 ft.
George W. Cooper 34 Waggoner C, 5 bbl. daily, pumping, 680-90 ft.
K.M.A. field: Grace & Murphree 4 Burnett, 54 bbl. in 3 hr., ¾-in. choke, 200-qt. shot, 4,097-4,132 ft.
W. L. Hawkins 1 Warren, dry at 1,790 ft.
Tide Water et al 7 Ferguson, deepened to 3,815 ft. from 3,785 ft., 72 bbl. daily.

Wilbarger County

Wilbarger field: Christie Hickman Drlg. Co. 2 Waggoner, 25 bbl. daily, pumping, 1,914-18 ft.

Young County

Wildcat: L. T. Burns 1 Bloodworth, dry at 903 ft., located Sec. 214, T.E.&L. Sur.
Olney field: Cato Bros. 5 Hamilton, 10 bbl. pumping, daily, natural, 879-89 ft.
Johnson & Kouri 1 Hamilton, dry at 928 ft.
Kimmel Lee & Co. 3 Campbell B, 41 bbl. daily, pumping, natural, 960-70 ft.

NORTH TEXAS WILDCAT REPORT

Archer County

W. B. Hamilton 22 Cartwright, 660 ft. from W and S lines, James Webb Sur., Abst. 664, T.D. 5,211 ft., P.B. 5,164 ft., 60-qt. shot 5,149-61 ft., swabbing est. 10 bbl. oil per day, S.D. 5,211 ft.
Walter Gant 1 Hunter, SE NW Sec. 7, Blk. 1, H.&T.C. Sur., top Ellenburger 5,370 ft., T.D. 5,391 ft., P.B. 5,343 ft., tested dry, P.B. 5,203 ft., treated 3,000 gal. acid, no results, P.B. 5,201 ft., S.D. orders.
King Oil 1 Taylor, Lot 1, Sec. 13, A.T.N.C.L. Sur., top Ellenburger 4,963 ft., T.D. 5,055 ft., P.B. 4,700 ft., S.I. for 8 hr., open to test 9 bailers oil and 2 bailers water, now S.I.
Adams Oil & Gas 1 Powell, SE Lot 14, Sec. 1, S.P.R.R. Sur., Abst. 406, 5,200-ft. test, top Caddo 4,986 ft., show oil 4,987-93 ft., 5,100-03 ft., making electrical survey of hole, T.D. 5,261 ft.
Deep Oil and Christie 1 G. Moer, SW SW Sec. 21, Clark & Plumb Sur., Blk. 3, drilling 5,106 ft.
Jack Story, Jr., 1 L. F. Wilson, NE Lot 4, Sec. 86, A.T.N.C.L. Sur., 1,600-ft. test, show oil 1,543-50 ft. in sand, installing pump 1,550 ft.
Consolidated Oil 1 Humphrey, 467 ft. from S and W lines of E. S. Heath Sur., Abst. 176, 4,400-ft. test, drilling 2,660 ft.
Petroleum Producers 1 M. Lynch, 2,310 ft. from W and 330 ft. from S lines, Sec. 20, Palo Pinto C.S.L. Sur., top K.M.A. lime 3,940 ft., drilling 4,490 ft., missed Kadane pay level.
George Keith 1 Prideaux, SW Sec. 1867, T.E.&L. Sur., 900-ft. test, 10-in. 176 ft., drilling 450 ft.
Magnolia 1 Hayton, SE SE SE Sec. 2415, T.E.&L. Sur., 5,400-ft. test, show oil 1,395-1,408 ft., tested water, drilling 1,565 ft.

Clay County

Carlos Wagner 1 L. C. Thaxton, Sec. 2, T.&N.O. Sur., 6,500-ft. test, drilling 5,600 ft.
Bridwell Oil 1 W. H. Myers, C. Thompson Sur., Abst. 444, 5,500-ft. test, drilling 4,355 ft.
Gulf 1 C. W. Scaling, NW NW Sec. 31, T.&N.O. Sur., Abst. 685, 6,000-ft. test, drilling 3,862 ft.
L. T. Burns 1 Southerland, NE cor. of 100 acres, of Sec. 63, J. H. Belcher Sur., 5,500-ft. test, show oil 3,793-3,807 ft., T.D. 4,064 ft., tested 180 ft. oil-cut mud, S.D., may take D.S. test.
L. W. Stanford 1-A Edrington, 8,689 ft. from S and 150 ft. from E lines of F. W. Grassmeyer Sur., Abst. 694, 1,200-ft. test, first report.
T. A. Norwood 1 C. H. Nently, N 60 acres of Sec. 51, Specht & McCutchin subd., 1,350-ft. test, first report.
T. A. Norwood 1 Hansard, 1,736 ft. from N and 914 ft. from W lines of lease in Thornberry subd., 1,250-ft. test, first report.
L. T. Burns 1 Fred Wines, 593 ft. from N and 476 ft. from E lines of Sec. 1, Halsell subd. No. 1, 5,500-ft. test, first report.

Cooke County

R. P. Farris 1 Houston, 3,500 ft. from S and 3,600 ft. from E lines of Charles DeMorse Sur., Abst. 332 1,800-ft. test, drilling 1,531 ft.
Texas Co. 1 Bindel, 1,530 ft. from N and 330 ft. from W lines of Francis Hughes Sur., Abst. 439, 3,000-ft. test, first report.

Hood County

Aztec Oil 1 Gallagher, SW SE Robert Alway Sur., 3,000-ft. test, S.D. orders 2,200 ft.

Jack County

Continental 1 Robertson, M. J. Swan Sur., Abst. 1650.
(Continued on Page 81)

Four Probable Pool Openers Test Balcones Fault Line

By
F. L. SINGLETON

CORPUS CHRISTI, Tex., Mar. 3.—Main interest in the Southwest Texas district centered along the Balcones fault line as testing was under way at four probable pool openers. Wildcatting throughout the district was showing an increase, and important extensions were promised in two fields.

Fred Pederson 1 Irene Brown, a deep test located in the Tanglewood area, Lee County, which began drilling operations in 1938, was showing evidence of making a small producer. The hole is bottomed in what is believed to be the Travis Peak at a total depth of 8,786 ft., and the well is testing through perforated casing at 6,380-90 ft. Approximately 150 bbl. of oil and mud was recovered by swabbing in 2 days, after which the well began flowing, and in 22 hours it made 36 bbl. of oil through a ⅛-in. choke with tubing pressure above 500 lb. The oil, which is 36 gravity, has a slight trace of water, but has such a high paraffin content that it was necessary to warm it before a gravity reading could be made. Several showings of oil have been logged and the present section being tested is believed to be the Glen Rose lime.

In Caldwell County and located about 4 miles southeast of Dale, Ralph Ogden and Riddle Oil Co. 1 Copeland topped the Austin chalk at 2,230 ft. and the well is being tested after cementing 7-in. casing at 2,000 ft. Top of the Dale lime was logged at 2,025 ft. and lime with a showing of oil was cored at intervals from 2,046-2,223 ft. After swabbing with a slight show of oil the well was treated with 3,000 gal. of acid and at the close of the week the fluid rose 500 ft. in 12 hours. It is the general opinion that the operators will be able to complete the well for a small pumper.

In Medina County and south of Dunlay, J. W. Duncan and F. A. Brown 1 Haby cored lime with a slight gas odor at 1,550-65 ft. and 7-in. casing was cemented at 1,230 ft. At the close of the week the operators were bailing and the well was showing a small amount of gas.

J. S. Tuttle 1 R. J. Heubinger, southeast of Lavernia, Wilson County, is bottomed at 1,807 ft. and 5½-in. casing was cemented at 1,647 ft. Sand and shale with a show of oil was cored at intervals from 1,721-50 ft. After the hole was bailed dry with a slight show of oil, the operators were preparing to wash the well with water. The Midway was topped at 1,340 ft. and the Navarro at 1,668 ft.

Pettus Sand Discovery Testing

Bee County.—J. R. Dougherty 7 Hicks, a probable new Pettus sand discovery in Bee County, was in the final stages of completion as tubing was being run following a 1½-hour drill-stem test at 4,140-78 ft., which tested 570 lb. working pressure. The well sprayed 2 bbl. oil and 510 ft. of oil was recovered. The well is located about 3 miles southwest of Normanna in the J. M. Uranga grant.

East Flour Bluff.—In the East Flour Bluff field, Nueces County, Humble Oil & Refining Co. staked location for a directional well to be drilled in an attempt to kill the company's 6-D State which blew out and caught fire from a deep sand bottomed at 8,570 ft. This well was temporarily shut down the previous week when it began to show excessive pressure, and the well caught fire while the company was bleeding the well in an attempt to lower the pressure so that it could be killed by pumping in heavy mud. The well is estimated to be making 30,000,000 cu. ft. of dry gas per day. The relief well will be drilled 1,000 ft. south in tract No. 30.

Marine locations.—Applications to drill several marine locations in San Antonio Bay, Calhoun County, have been filed with the War Department by the Gulfboard Oil Co. Permits were requested for Tracts 82, 83, 91, 93, 94, 113, 114, 115, 123 and 124. This area is situated east of Dagger Point about 11 miles south of Seadrift.

Nueces County.—Wildcatting along the east flank of the Agua Dulce-Stratton fields, Nueces County, continues to gain momentum with the announcement of two more wells. Two miles northeast of Banquette, W. B. Osborn and Mid-Continent Petroleum Corp. is moving in material for 1 E. Burow in the V. L. de Herrera grant, a projected 7,500-ft. well. East of the Agua Dulce field, John G. Mayo et al staked location for 1 Hugh Wolter on a 246-acre tract in Section 81, George Paul subdivision of the Driscoll ranch. This lease was recently acquired for a reported consideration of $50,000, part of which was in cash and the balance in oil. Two other important tests were recently started by Ginther et al and the Shasta Oil Co., both tests being northwest and southeast of F. A. Gillespie 1 Dabney, an outpost test in the Agua Dulce field which was completed several weeks ago as a distillate producer.

Robstown field.—Location for another test was made in the Robstown field, Nueces County, by Richardson Petroleum Co. The well is 1 Joe Jureka in the M. L. de Herrera grant, Lot 7, Block 7, about 678 ft. northeast of the company's 1 Studer, the discovery well. This is the second location reported within the past 2 weeks, as Jay Simmons spudded 1 E. W. Naumann, located on a farmout lease from Shell Oil Co., Inc.

Willamar extension.—A major extension to the Willamar field, Willacy County, was indicated as Pan American Production Co. was running 5½-in. casing in 1 Kent which is bottomed at 9,000 ft. The well is located about 1½ miles northwest of the discovery well. Details as to where the well will be tested were not available. The company's 1-B Community, 1,000 ft. southeast of the discovery well, completed the previous week as a producer through perforated casing at 7,855-80 ft., has been killed and the company is attempting to squeeze off an upper gas sand at 7,842-50 ft.

Boyle field.—A mile west extension to the Boyle field, Starr County, was indicated by the showing of F. W. Zimmerman et al 1 Garcia, which is shut down for orders after a drill-stem test at 2,792-2,812 ft. recovered 260 ft. of oil. Whether casing will be cemented for a production test or whether the well will be drilled deeper to the main pay at 3,000 ft. was not announced.

Other wildcats.—Location for five wildcats were announced for the Laredo district, two of which were located in Duval County and the balance in Webb, Starr and Jim Hogg counties. Twelve miles northwest of San Diego, in the James House Survey No. 6, Sun Oil Co. staked location for a 4,600-ft. test on the A. G. Black Survey, while 4 miles east of Bruni, location for a shallow test was announced by the E. C. L. Oil Co. for 1 Rosa Benavides in Survey No. 19.

In Webb County, and located on the Hamilton ranch, Magnolia Petroleum Co. is preparing to drill a Wilcox test in the Joaquin Galan grant. The company controls a block of several thousand acres which have been worked extensively with geophysical instruments. Northwest of Rio Grande City in Porcion 75, tract No. 8, Louis P. Schawe staked location for a shallow test, while in Jim Hogg County and about 7 miles south of Randado, Forest Development Co. is moving in material for 1 San Juan de Ramirez in the H.&G.N. Survey No. 271, Share 5, a projected 3,200-ft. test.

SUMMARY OF COMPLETIONS

Lower Gulf Coast District

	No.	Bbl.	Footage
Oil wells: Fields	10	1,169	55,165
Dry holes: Fields	1	.....	60,076
Total	11	.....	115,241

San Antonio District

Oil wells: Fields	1	87	3,971

Laredo District

Oil wells: Fields	11	1,227	30,231
Dry holes: Fields	1	.....	4,083
Total	12	.....	34,314

SOUTHWEST TEXAS COMPLETIONS

LOWER GULF COAST DISTRICT

Jim Wells County

Ben Bolt field: Bridwell 3 Smith, 334 bbl., ⅞-in. choke, perf. casing 5,243-48 ft., T.D. 5,249 ft.
South Alice field: Cimarron 1 Salyer, 51 bbl., ⅛-in. choke, sand 5,215-25 ft., T.D. 5,232 ft.
Wade City field: T. H. McElvain 5 Blaschke, dry, T.D. 4,911 ft.

Nueces County

Clara Driscoll field: Phillips 1 J. E. Howze, 87 bbl. oil and 42 bbl. salt water, ⅛-in. choke, perf. casing 3,820-23 ft., T.D. 3,875 ft.
Texas Conservative 3-B Flynn, 114 bbl., ⅛-in. choke, perf. casing 5,472-77 ft., T.D. 5,710 ft.
Stratton field: Corpus Christi Corp. 14 Wardner, 106 bbl., ⅛-in. choke, perf. casing 6,390-6,400 ft., T.D. 6,616 ft.

San Patricio County

Midway field: British American 1 Coggin, 118 bbl., ⅛-in. choke, perf. casing 5,339-41 ft., T.D. 6,200 ft.
Midway Victory Oil Co. 3-A Floerke, 117 bbl., ⅛-in. choke, perf. casing 5,329-32 ft., T.D. 5,350 ft.
Phillips 5 Ivey, 98 bbl., plus 14 per cent salt water, ⅛-in. choke, perf. casing 5,298-5,303 ft., T.D. 5,396 ft.

Victoria County

Heyser field: Gulf 51 Traylor, 129 bbl., ⅛-in. choke, sand 5,480-92 ft., T.D.
Placedo field: Sun 4 Schneider, 15 bbl., ⅛-in. choke, perf. casing 4,755-59 ft., T.D. 6,045 ft.

LAREDO DISTRICT

Cedro Hill field: Magnolia 22 Duval County Ranch Co., 32 bbl., ⅝-in. choke, sand 1,506-11 ft., T.D.
Magnolia 23 Duval County Ranch Co., 35 bbl., ⅝-in. choke, sand 1,473-76 ft., T.D.
Charamousca field: Magnolia 12 Duval County Ranch Co., dry, T.D. 1,590 ft.
Magnolia 1 Duval County Ranch Co., dry, T.D. 2,493 ft.
Hoffman field: Gilcrease 2-A Salazar, 47 bbl., 3/32-in. choke, perf. casing 2,631-33 ft., T.D. 2,634 ft.

Hidalgo County

Nichols field: Baldridge & King et al 2 Yturria Town & Improvement Co., 124 bbl., ⅛-in. choke, perf. casing 3,869-74 ft., T.D. 3,974 ft.

Jim Hogg County

Colorado field: K. D. Harrison 5-A Trevino, 225 bbl., ¼-in. choke, sand 3,032-45 ft., T.D.
Humble 23 Atwood, 11 bbl., pumping, T.D. 3,045 ft.
Humble 15-B King, 198 bbl., ⅞-in. choke, T.D. 3,046 ft.

Starr County

North Rincon field: Sun 2 Coates, 200 bbl., ⅞-in. choke, 20 per cent salt water, perf. casing 4,379-89 ft., T.D. 5,109 ft.

Webb County

Glen field: Interstate Minerals 53 Lopez, 175 bbl., pumping, sand 2,166-76 ft., T.D.
Transwestern 6 Yeager-Stroman, 180 bbl., pumping, sand 2,169-76 ft., T.D. 2,185 ft.
Killam field: O. W. Killam 6 Villareal, 60 bbl., pumping, perf. casing 1,994-98 ft., T.D. 2,030 ft.

SAN ANTONIO DISTRICT

Frio County

Pearsall field: Falcon-Seaboard 2 Melms, 87 bbl., pumping, perf. casing 3,948-55 ft., T.D. 3,971 ft.

SOUTHWEST TEXAS DRILLING REPORT

Cameron County

Pure 4 Gatewood Newberry, southwest of Point Isabel, drilling 9,650 ft.

Dimmitt County

Humble 1 Catarina farms, T.&N.O. Sur., drilling shale 2,730 ft.

Duval County

Henderson Coquat 1 Ysidro Garcia, Jose Marcell Hinojosa grant, drilling shale 4,528 ft.

Jim Hogg County

Sun 1 Campbell, south of Hebronville, coring shale 4,460 ft.

Kleberg County

Skelly 1-388 State, Baffin Bay field, dry, T.D. 10,044 ft.

La Salle County

Quintana 3 Washburn, northwest of discovery well, Washburn field, drilling shale 3,610 ft.
William H. Spice 1 D. C. Reed, T. Conlaw Sur., coring 5,137 ft.

Live Oak County

Edwin M. Jones 3-B George West, southwest of George West, Nelson Owen Sur., drilling sandy shale 8,737 ft.

By
R. MARNE SANFORD

Search for Deep Pay Horizons Continues in Pecos Valley

MIDLAND, Tex., Mar. 3.—The search for deep production in West Texas, although centered in the southern part of the Permian basin at the present time, is spreading to embrace new wildcat areas throughout northern Pecos County and southern Ward and Crane counties. There have been a total of six new deep discoveries in this area within the past 1½ years, making a total of seven deep producing spots for the district, including the original Sand Hills Ordovician field in Crane County.

During the past week a new Ordovician wildcat test was staked about 2 miles west of the Apco field of northern Pecos County, and new blocks of acreage were taken by major companies along the Pecos and Crane county line which indicates that deep production will also be sought in this area.

Another new wildcat for the week was staked north of the Abell field in Pecos County, also projected to the deep level. The Abell field outpost was staked by Magnolia Petroleum Co. and will be 1 Gerety, 330 ft. from the south and east lines of Lot 12, Section 23, Block 9, H.&G.N. Survey, 3,000 ft. northwest of 1-A McKee, one of the first deep tests drilled in the area which found shows of oil prior to being declared a failure about 2 years ago. The outpost is also 10,000 ft. due north of the Abell field discovery well.

The new location west of the Apco field is M. D. O'Quinn 2 O'Neil, a twin well to the operator's 1 O'Neil, which was completed a few months ago as a shallow discovery well. The new location is 467 ft. from the southeast and southwest lines of Section 74, Block 10, H.&G.N. Survey, approximately 2¼ miles west and slightly south of the Apco field. The Apco field produces from the Ellenburger lime of Ordovician age at the 4,575-ft. level, while the Abell field produces from the Simpson lime of Upper Ordovician at the 5,300-ft. level.

There are 3 Ellenburger lime producing spots in the general vicinity of the Apco field, the other two being the Olson field and the Heiner field, both one-well areas, with the latter being officially declared a producer only this week. The Olson field is a one-well spot about 2 miles southwest of the Apco field, the discovery well being Olson Drilling Co. and Bryce McCandless 1 Crockett, Section 5, Block 10, T.C. Survey, productive from the 4,500-ft. level. The discovery was completed for 298 bbl. of oil in 2½ hours or at the rate of approximately 2,500 bbl. daily. However, no further development has been made in the area since its completion in February of 1940.

Heiner area.—About 9 miles west and slightly south of the Apco field is the Heiner area, officially opened this week with only a small gage being reported for the discovery well. It is Culbertson & Irwin, Inc. 1 Heiner, NW cor. Section 589, G.C.&S.F. Survey, in the old shallow Byrne field. The well flowed at the rate of 36 bbl. daily for the last 3 days of the past week. Production is from saturated Ellenburger lime drilled in broken sections from 5,169 to 5,541 ft., plugged back from sulfur water at a total depth of 5,565 ft. The pay was treated with 9,500 gal. of acid and the flow was through a hookup of six flow valves in the tubing. At intervals during the 3-day flow the well made as much as 10 per cent basic sediment and water. This discovery is the least promising of the six deep discoveries for the district.

Abell.—Seeking to extend the Abell field both to the southeast and to the east, two outpost tests are getting under way. About 1 mile east of the discovery well Sinclair Prairie Oil Co. is preparing to start 1 Grove, 330 ft. from the SE cor. of Lot 9, Section 26, Block 10, H.&G.N. Survey, contracted to the Abell field pay level. Some 4 miles east and slightly south of the Abell field Stanolind is starting 1 Conry-Davis, 467 ft. from the south and west lines of Section 31, Block 9, H.&G.N. Survey. This is a proposed Simpson lime test.

SUMMARY OF COMPLETIONS

Northern West Texas

	No.	Bbl.	Footage
Oil: Slaughter field	8	8,522	40,036
Seminole field	3	2,126	16,010
Wasson field	5	5,516	25,877
Other fields	1	402	4,765
Dry: Wildcats	1	.....	5,864
Total	17	.....	92,552
Old wells drilled deeper	3	3,428	.....

Southern West Texas

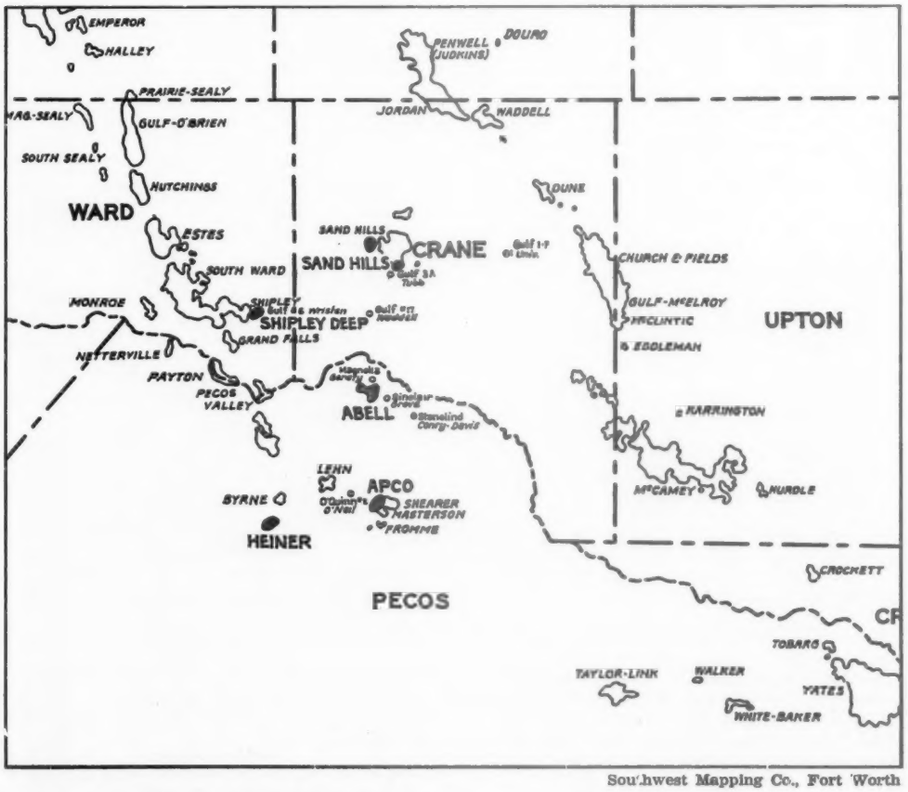
	No.	Bbl.	Footage
Oil: Taylor-Link field	2	466	3,462
Ector County	2	1,341	8,518
Other fields	4	4,600	13,076
Discovery wildcat	1	196	1,452
Dry: North Cowden deep tests	1	.....	7,000
Total	10	.....	33,508
Old wells drilled deeper	2	359	.....

Texas Panhandle

	No.	Bbl.	Footage
Oil wells: Carson County	1	66	3,130
Gray County	1	55	3,100
Hutchinson County	5	1,639	15,126
Wheeler County	1	104	2,458
Total	8	.....	23,814

Southeast New Mexico

	No.	Bbl.	Footage
Oil wells: Maljamar field	3	1,183	11,906



Southwest Mapping Co., Fort Worth

Centering practically all of the attention in West Texas at present is the growing play for deep production in the northern Pecos, and southern Ward and Crane counties area. A total of six deep discoveries, from the Ellenburger, Simpson and Silurian levels, have been opened since the play started and increased deep drilling is foreseen for the near future in both Ward and Winkler counties as well as throughout northern Pecos and southern Crane counties. The deep fields are shaded and printed in heavier type. Important deep wildcats are spotted

Crane County Deep Tests

In Crane County a deep wildcat, the deepest ever drilled in the area, is going ahead below 9,615 ft. in chert, unidentified. It is Gulf 1-F University, Section 22, Block 31, University Lands Survey, in the eastern part of the county. It is being drilled as a tight operation.

Sand Hills.—As a west-edge test to the Sand Hills Ordovician Extension field in central Crane County, Gulf 3-A Tubb, Section 20, Block 27-B, P.S.L. Survey, is drilling below 675 ft. toward the Ellenburger lime found in the field proper and in the steadily developing extension area.

Shipley Deep field.—Westward and in Ward County the second operation is going ahead in the Shipley Deep field, the Silurian discovery recorded by Gulf Oil Corp. late in 1940. The discovery was Gulf 5 Wristen Bros., ½ mile south of the Shipley field in the southeastern corner of the county. Production was from the Fusselman lime of Silurian age drilled with saturation from 7,018-60 ft. This was the first Silurian production opened in Texas. The same company's 6 Wristen, Section 18, Block 5, H.&T.C. Survey, east offset to the discovery, is drilling below 3,900 ft. after encountering shows of oil from 3,860-80 ft. which indicated another new and shallower pay for the area. The show was passed up for the deeper level.

Leasing Activity

Strong indications of continued deep wildcatting in this southern basin district are seen in the taking of several large blocks along the Ward and Winkler county line and also along the Pecos and Crane county

line. About 2 weeks ago the Shell Oil Co., Inc., exercised an option on 21,600 acres of land in Ward and Winkler counties, taking this amount of acreage out of a total under consideration for several months of 52,960 acres. Prices averaged about $2.50 per acre, with the majority of the leases being in Block A, G.&M.M.B.&A. Survey, Winkler County, and the same block and survey in northern Ward County. A deep 9,000-ft. wildcat is being planned in southern Winkler and an 8,500-ft. test in northern Ward County, neither location having been definitely staked as yet.

During the past week Cities Service Oil Co. acquired two tracts of 100 and 140 acres each, respectively, in southern Crane County and south of the Gulf 17 Waddell, an Ordovician projected wildcat some 4 miles south of the Sand Hills extension Ordovician field. The tracts were in Section 26, Block 1, H.&T.C. Survey, averaging about $16 per acre.

SOUTHERN WEST TEXAS COMPLETIONS

(24-hr. ratings based on last 3 hrs. of 6-hr. gage)

Crane County

McElroy field: Gulf 25 Henderson, 383 bbl., ¾-in. choke, 360-qt. shot, 3,255-3,556 ft.
Sand Hills Permian field: Humble 51 Tubb, 3,420 bbl., open tubing, 2,500 gal. acid, 4,256-4,404 ft.

Crockett County

Discovery wildcat: Wahlenmaier & Curry 1 Bean, SW NE Sec. 48, Block UV, G.C.&S.F. Sur., 196 bbl. oil with 5 per cent water, 1,000 gal. acid, 1,451-52 ft.

Ector County

Johnson field: Continental 4-B Johnson, 350 bbl., open tubing, 400-qt. shot and 1,000 gal. acid, 4,200-4,300 ft.
Goldsmith field: Gulf 338 Goldsmith, 991 bbl., open casing, 4,000 gal. acid, 4,154-4,218 ft.
Deep test in North Cowden field: Stanolind 1 Cowden, top Cowden anhydrite 2,510 ft., frosted quartz of Yates 2,840 ft., brown lime 3,710 ft., solid lime 3,855 ft., San Andreas lime 4,240 ft., Clear Fork 5,190 ft., dry at 7,000 ft.

Pecos County

Pecos Valley field: Jameson & Pollard 6-DE Pecos Valley, 193 bbl., plus 89 per cent water, through 4-in. flow line off casing, 2,037-41 ft.
Taylor-Link field: Landreth 1-J University, 182 bbl., plus 10 per cent water, pumping, 2,500 gal. acid, 1,745-87 ft.
Landreth 2-K University, 284 bbl. plus 31 per cent water, pumping, 1,000 gal. acid, 1,674-84 ft.

Upton County

McElroy field: Gulf 21 Crier-McElroy, old T.D. 2,800 ft., new T.D. 2,840 ft., shot 710 qt., 2,570-2,840 ft., new initial 304 bbl. daily.
Shell 4 Bowen, old T.D. 2,181 ft., new T.D. 2,190 ft., 1,000 gal. acid, new initial 55 bbl. oil and 17 bbl. water, pumping, daily.

Ward County

Hutchins field: Gulf 152 Hutchins, 604 bbl., open tubing, 916-qt. shot, 2,545-3,075 ft.

SOUTHERN WEST TEXAS WILDCAT REPORT

Crane County

Gulf 1-F University, SE SE Sec. 22, Blk. 31, University Sur., drilling 9,603 ft.
Gulf 17 Waddell, Sec. 13, Blk. 3, H.&T.C. Sur., 4 mi. S of Sand Hills field, drilling 4,915 ft.
Eastham & Russell 1 McClintic, NE NE Sec. 210, Blk. F, C.C.S.D.&R.G.N.G. Sur., drilling 1,648 ft.

Crockett County

I. T. I. O. Roy Henderson, NW SE Sec. 33, Blk. ST, 2,000 ft., T.D. 1,909 ft., prep, quit as failure.
George T. Morris 1 Brock Hoover, SW SE Sec. 99, Blk. 1, I.&G.N. Sur., 2,000-ft. test, drilling 782 ft.

Culberson County

Cecil Cothrun 1 Casey-Rounsoville, Sec. 7, Blk. 104, P.S.L. Sur., drilling 1,340 ft.

Ector County

Cities Service 1 F. V. Addis, SW SE Sec. 34, Blk. 43, Twp. 2s, T.&P. Sur., T.D. 5,156 ft., hole 10° off vertical, P.B. 4,795 ft., redrilling lower part of hole.

Loving County

H. C. McAuley 1 E. Hall, SE Sec. 60, Blk. 7, W.&N.W. Sur., S.D. 3,852 ft.
Pinal Dome Oil 1 Michigan Oil fee, NW SW Sec. 15, Blk. 26-C, P.S.L. Sur., 5,300-ft. test, drilling 197 ft.

Pecos County

Culbertson & Irwin 1 R. G. Heiner, NE NE Sec. 589, G.C.S.F. Sur., Ordovician wildcat, show oil in upper Ellenburger lime, show oil 5,382-90 ft. and 5,500-10 ft., T.D. 5,665 ft., P.B. 5,509 ft., flowed 36 B.O.P.D. for 3 days.
Stanolind 1 Conry-Davis, SW SW SW Sec. 31, Blk. 9, H.&G.N. Sur., Ordovician test in Abell area, drilling 440 ft.
O'Quinn 2 O'Neil, S½ Sec. 74, Blk. 10, H.&G.N. Sur., Ordovician test, first report.
Sinclair Prairie 1 Grove, Lot 9, Sec. 26, Blk. 9, H.&G.N. Sur., Ordovician test, first report.

Reagan County

H. Schooler 1 R. A. Wolters, NE NE Sec. 51, G.C.&S.F. Sur., S.D. for 8-in. casing 975 ft.

Reeves County

Roy Johnson 1 Perkins, Sec. 18, Blk. 7-C, P.S.L. Sur., S.D. 3,298 ft.

Terrell County

Texas Consolidated Oil 1 Holmes, NE NE Sec. 14, Blk. 2-A, G.H.&S.A. Sur., 3,600-ft. test, 10-in. 1,100 ft., T.D. 1,275 ft., prepare to start up.
E. M. Thomasson 3 Bates-Graham, 660 ft. from N and 2,490 ft. from W lines, Sec. 30, Blk. 1, I.&G.N. Sur., S.D. 950 ft.

Upton County

H. C. Wheeler 1 Kincaid, 2,173 ft. from N, 467 ft. from E lines Sec. 1, G.C.&S.F. Sur., first report.
Pittman & Atkins 1 Fowler-Starnes, NW NE Sec. 89, G.C.&S.F. Sur., first report.

Ward County

Gulf 6 Wristen, 1,997 ft. from SE and 1,989 ft. from NE lines, Sec. 18, Blk. 5, H.&T.C. Sur., deep Silurian test, saturation 3,860-80 ft. and 3,900-20 ft., cemented 7-in. at 3,832 ft., drilling 4,200 ft.
Roeser & Pendleton, Inc., and Merry Bros. & Perini 1 Bird Hayes, 467 ft. from SE and SW lines, Sec. 164, Blk. 34, H.&T.C. Sur., ¼ mi. N of discovery gas well, top sat. in Delaware sand 5,089 ft., T.D. 5,396 ft., P.B. 5,130 ft., prepare to test.

Winkler County

Stanolind and Westbrook 1 Maracaibo, NW NW Sec. 19, Blk. 26, P.S.L. Sur., 2½ mi. NW Hendricks field, fishing drill pipe 3,377 ft.

NORTHERN WEST TEXAS

The deep wildcatting now gaining in momentum throughout West Texas is not necessarily limited to the southern part, although that area is the center of Ordovician activity. The northern plains area in the north Permian basin is receiving no little attention as regards deep possibilities.

Hale County test.—During the past week a new deep wildcat, the deepest ever to be announced for the plains area, was staked in Hale County, about midway between northern Permian basin production and production in the Texas Panhandle fields. It is to be drilled jointly by Humble, Stanolind and Standard of Texas, and will be 1 A. F. Byrd, 660 ft. from the north and east lines of Section 17, Block K, 3 miles north of the town of Petersburg, in the southeastern part of the county. It is understood that the three companies are contributing $35,000 or the equivalent in acreage toward the deep operation. Stanolind has extensive leases in southeastern Hale County, as does Humble, while Standard of Texas has widespread leases in western Floyd County. The location is only ½ mile from the Floyd County line. The actual drilling block consists of some 18,000 acres, while all of the companies, as well as Amerada and Sinclair Prairie, hold much greater blocks of leases throughout the area.

Martin County.—In Martin County Magnolia Petroleum Co.'s deep 6,000-ft. operation started a few weeks ago, is reported to be checking favorably, geologically, as drilling progresses below 2,860 ft. The top of the anhydrite was picked up at 1,930 ft., plus 1,001 ft., or regionally high, while the Yates was found at 2,690 ft., plus 241 ft., also regionally high. The operation is located in the Teague ranch, Labor 10, League 260, Borden County School Lands Survey, northern Martin County.

NORTHERN WEST TEXAS COMPLETIONS

(24-hr. ratings based on last 3 hr. of 6-hr. gage)

Andrews County

Wildcat: Phillips 2 Embar, NE SE Sec. 5, Blk. 44, Twp. 2n, T.&P. Sur., dry at 5,864 ft.

Cochran County

Slaughter field: Magnolia 2 Woodley, 1,064 bbl., 3-in. casing outlet, 10,500 gal. acid, 4,935-93 ft.

Gaines County

Seminole field: Amerada 3 Hahn, 863 bbl., ½-in. choke, natural, 5,124-5,335 ft.
Amerada 2 Lamb, 800 bbl., ½-in. choke, natural, 5,086-5,305 ft.
Amerada 1 Northrup-Carr, 463 bbl., ½-in. choke, 3,000 gal. acid, 5,286-5,370 ft.
Wasson field: Continental & Carter 9-44 Moore & Langdon, 806 bbl., open tubing, 10,000 gal. acid, 4,875-5,041 ft.
Cedar Lake field: L. C. Harrison 2 White, 402 bbl., open tubing, 480-qt. shot, 4,580-4,765 ft.

Hockley County

Slaughter field: Awoeb Oil 4 Barry, 1,155 bbl., 2-in. casing outlet, 9,000 gal. acid, 4,925-5,000 ft.
Awoeb Oil 2-B Mid-Seale, 955 bbl., 2-in. casing outlet, 10,000 gal. acid, 4,900-5,017 ft.
Awoeb Oil 3-D Mid-Seale, 1,052 bbl., 2-in. casing outlet, 9,000 gal. acid, 4,890-5,004 ft.
Magnolia 3-D Mallett, 1,237 bbl., 3-in. casing outlet, 10,500 gal. acid, 4,885-5,000 ft.
S. W. Richardson 2-B Slaughter, 972 bbl., 2-in. casing outlet, 8,000 gal. acid, 4,880-4,978 ft.
San Andres Oil 3-A Caddell, 425 bbl., 2-in. casing outlet, 10,000 gal. acid, 4,885-4,995 ft.

Howard County

Roberts field: Magnolia 16 Roberts, old T.D. 2,582 ft., new T.D. 2,969 ft., new top pay 2,949 ft., new initial 1,236 bbl. daily, pumping.

Terry County

Slaughter field: Gulf 5 Mallett, 1,662 bbl., open tubing, 10,000 gal. acid, 5,020-40 ft.

Yoakum County

Wasson field: Oil Development Co. 14-763 fee, 1,015 bbl., 1¼-in. choke, 11,00 gal. acid, 5,020-5,270 ft.
Shell 9-B Baumgart, 1,397 bbl., open tubing, 10,000 gal. acid, 4,915-5,181 ft.
Shell 4 Dowden, old T.D. 5,063 ft., deepened to 5,155 ft., treated with 5,000 gal. acid, new initial 632 bbl. daily.

(Continued on Page 75)

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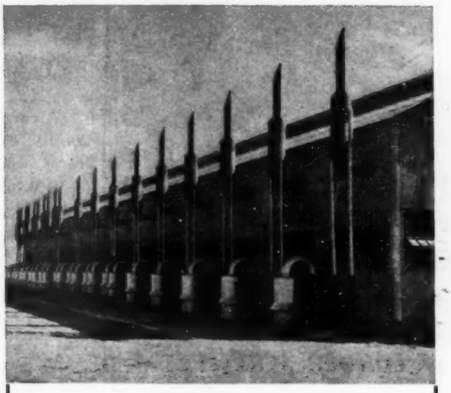

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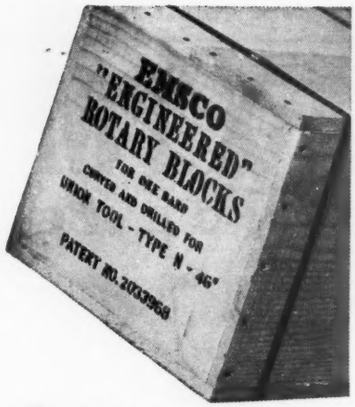

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Among the Drilling

S. C. HERRING, contractor of Abilene, Tex., is indicating the discovery of a new field in southern Jones County, West Central Texas, for Harry Hines and associates at 1 A. M. Winberly. The wildcat is about midway between the Stith and Akard fields and is located in the SW cor. of Subdivision 87, De Witt County School Lands Survey. Saturation was drilled in Cook sand from 2,215-33 ft. and testing is under way.

JOE COSNER and J. H. DUNN, San Antonio, Tex., contractors, are rigging up to drill Harry Karotkin and C. R. Jones 1 Hranicky, a semi-wildcat operation in Jim Wells County, Tex., ½ mile north of the Reynolds field.

TRINITY DRILLERS, Inc., San Antonio, Tex., received contract from Transwestern Oil Co. for 1 Archie Clark, located southwest of the discovery well of the new Coloma Creek field in Calhoun County, Texas.

HELMERICH & PAYNE, Inc., Tulsa, and Guy Hannum of Oklahoma City have started operations on 1 Hennessy, a wildcat test near Tryon in Lincoln County, Oklahoma. Objective is the Wilcox sand expected around 5,000 ft.

SCHONFELD - HUNTER - KITCH Drilling Co., Oklahoma City, Okla., has granted retirement to Robert Scott (Uncle Bob) James, veteran cable-tool driller who started working in West Virginia fields in 1898. He was the honor guest last week at a testimonial dinner tendered by the equipment and supply companies in Oklahoma City. Mr. James was in charge of the cable-tool crew that drilled in the discovery well at Oklahoma City in December 1928.

GLENN H. McCARTHY is moving a rotary to the Bailey's Prairie area, Brazoria County, Texas, for his 1 J. R. Marmion, a projected deep test located north of the discovery well in the Samuel Carter Survey.

BUTLER & HORNE Drilling Co., Dallas, Tex., joined by U. L. Miller, has started operations on 1 H. R. Merry, on the north end of the Lewis-Steffens field in Jones County, Texas. The location is northwest of Sandy Ridge Oil Co.'s recent deep-pay discovery which was completed for 210 bbl. daily through a ¼-in. choke at 2,014 ft.

HARRY L. EDWARDS Drilling Co., Houston, Tex., started drilling operations on a Wilcox test in Liberty County, Texas, for C. G. Hooks 1 Lockin, located in the Spencer Kirkham Survey. In the old Ocean field, Brazoria County, three new wells were being started, two for Harrison & Abercrombie and one for Shell Oil Co., Inc. Derrick was being built in the Dickinson field for Pan American Production Co., while in the Esperson field one operation is reported for the General Crude Oil Co.

ENGLISH Drilling Co. is rigging up 1 May in the Cement townsite, Caddo County, Oklahoma.

H. & H. Drilling Co. has sold its producing well on the J. W. Medlin 8-acre lease in the William King Survey, Upshur County, Texas.

NICKLOS Drilling Co., Houston, Tex., has moved a third rotary to the Ville Platte field, Evangeline Parish, Louisiana, for Continental Oil Co. In the Morgan City area, St. Mary Parish, an 11,300-ft. hole was abandoned for the Texas Co., while in the shallow Richie field, Acadia Parish, preparations were being made to complete 2-A McManus at a total depth of 3,518 ft.

ROCKY MOUNTAIN Drilling Co. has purchased a new power rig for service in the Lance Creek field, Wyoming. The company has another similar rig operating in the same field. Both units are now engaged.

SHARON Drilling Co. is completing two Kansas operations. The company is testing after acidizing 1 Lillard, SW SE 6-16-11w, Barton County, which had 2½ ft. of slightly saturated dolomite at 3,278 ft. The company's 1 Nevius, SW SW NE 21-19-10w, Rice County, is drilling plug at 3,275 ft.

LON CRON, Houston, Tex., is moving another rotary to Wharton County, Texas, for 1 McGill, a projected 7,000-ft. wildcat located in the Lissie area, which will be drilled jointly with Cash & Reynolds. In the Danevang area R. O. Lowrance 1 Juhl is drilling below 7,200 ft.

CLAUDE Drilling Co. 2 Dick, NW NE 19-23-3w, Harvey County, Kansas, has been completed for 85 bbl. daily in pay topped at 3,266 ft. and drilled to 3,360 ft.

JOHN DEERING, Houston, Tex., is preparing to move a rotary to the Sheldon area, Harris County, Texas, for O. J. McCullough 1 W. S. Swilley,

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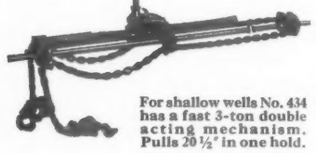
No. 434 **For shallow wells**



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a 4,500-ft. wildcat located in the Victor Blanco Survey.

AL BUCHANAN Drilling Co. is moving in rig to drill 1 Emil Burow for W. B. Osborn and Mid-Continent Petroleum Corp. The operation is 2 miles northeast of the North Agua Dulce field, Nueces County, and will be carried to 7,500 ft. unless production is obtained at a lesser depth.

AMERICAN Association of Oil Well Drilling Contractors, Houston, Tex., division, held its first meeting March 6. J. E. Brantly, president of the Drilling & Exploration Co. and president of the national association, organized last November, was the principal speaker. He reviewed organization meetings held by contractors in California, Oklahoma, and Louisiana.

PARKER Drilling Co., Houston, Tex., is drilling below 5,900 ft. in British American 2-71 State, a wildcat located offshore from Jefferson County in the Gulf of Mexico.

GEORGE ECHOLS, Houston, Tex., is rigging up in the newly opened St. Gabriel field, Iberville Parish, Louisiana, for a second well, and locations for three additional wells were announced. One rotary is running at the Double Gum area, Liberty County, Texas.

RUSO Drilling Co. has made location for its 1 Bird, 2 miles northwest of the Zurich field in southern Rooks County, Kansas. The operation is projected to the Arbuckle dolomite around 3,700 ft. Location is in the SE NW NW 21-10-19w.

UNGREN & FRAZIER, drilling contracting firm of Abilene, Tex., holds an interest in a new discovery well recently brought in for Fain-McGaha Oil Corp. in Jones County, West Central Texas. The well is No. 1 Julia Moore, in the T. Maltby Survey 252, about a mile south of the old five-pay Hawley field. Oil sand was drilled from 2,213-21 ft. in the upper Hope sand. It is estimated good for about 35 bbl. daily, natural; however, a shot in the pay is contemplated before final gaging.

ALEX McCUTCHIN, contractor of Tyler, Tex., has received contracts from General American Oil Co., Dallas, Tex., for a three-well drilling program in the new Hawkins field of Wood County, eastern Texas. The first is to be No. 1-A Kay, 70 ft. from the east line and 12 ft. from the north line of Lot 18, Block 21, Brewer Survey, in the townsite of Hawkins. The other two wells will be on townsite lots also.

C. J. DAVIDSON, Fort Worth, Tex., contractor and operator, accompanied by Mrs. Davidson, joined Mr. and Mrs. C. J. Cashman of Tulsa on a winter trip to Florida and Cuba. The couples met at Jacksonville. Mr. Cashman is manager of the Skelly Oil Co. land department.

JOHN DROPPLEMAN, Wewoka, Okla., contractor, married the former Miss Iris Russell of Tyler, Tex., February 17.

DICK SETTLES, Ohio contractor, has completed a small discovery well for Copper Head Oil Co. on the Thompson farm, Mary Ann Township, Licking County, Ohio, just east of Newark. The well is producing from the Berea at 700 ft. Initial was 25 bbl. daily.

OLSON Drilling Co. and Curtis F. Bryan have made location for 1 Wisey west of the Dill field and south of the town of Boley. Acreage surrounding the location, which is NE SE SE of 5-11-8e, is closely leased.

TOM HUNTER, drilling contractor of Wichita Falls, Tex., will drill a series of wells for Anderson-Prichard Oil Corp. on a proven tract in the Fargo field of Wilbarger County, North Texas. The tract consists of 50 acres near the center of Section 26, Block 15, H.&T.C. Survey. To date only the discovery operator, Amerada Petroleum Corp., has done any drilling in the field.

BIG WEST Drilling Co. has started a well on the T. F. Patton farm in Lincoln Parish, Louisiana.

DELTA Drilling Co. has resumed drilling on 1 Kangerga Brothers, deep wildcat test 4 miles north of Henderson in Rusk County, Texas, after setting 1,400 ft. of surface casing. Contract calls for drilling to 8,500 ft.

GRADY VAUGHN, contractor and operator of Dallas, Tex., was moving in materials last week for Texas Co.'s new wildcat test in the Pickering area of Shelby County, East Texas Border counties. Test is No. 1 fee, on a 160-acre tract in the Brooks Survey, about ½ mile east of the Portex Oil Co. recycling plant and the Pickering gas producers. It is a Glen Rose lime test.

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Trenton Discovery, Northwest Pennsylvania, Drilling Ahead

By STAFF CORRESPONDENT

NEWARK, Ohio, Mar. 3.—Drilling was proceeding this week in Ohio Oil Co. 1 Jay Childs in Springfield Township, Erie County, which last week reported the first show of oil to be found in the Trenton lime east of the Cincinnati arch fields of Ohio and Kentucky. At week's end the well was 31 ft. in the Trenton with slight shows of a light green oil. Top of the Trenton was 4,437 ft.

Five-inch casing was set in the hole when the show was struck, and after drilling the plug, the bit pounded into the hard lime making about a foot an hour. At last report, however, the bit was making about 6 ft. a run.

Company officials said their plans for deepening or drilling other wells had not been made yet and would depend on further testing in the Jay Childs.

In other sections Ohio operators had a successful week completing 21 gas wells, 7 oil wells, and 4 dry holes. Newark field in Licking County and Spencer pool in Medina County each yield gassers gaging better than 3,000,000 cu. ft. Meigs County has a shallow gasser at 800 ft. good for better than 1,000,000 cu. ft. open flow. The oil wells were small.

Deep tests.—In northwestern Ohio the Pure Oil Co. has commenced drilling a wildcat test 6 miles southwest of Carey in Wyandot County, NE SE Section 2, Richland Township, G. A. Kemmerly tract. In this area the Trenton is found at approximately 1,300 ft. and the St. Peter horizon at 1,900 to 2,000 ft.

There was no important change in the status of the other deep tests drilling in the state. Ohio Oil Co. test in Wooster Township, Wayne County, is drilling at 3,200 ft. Magnolia 1 Della Shrum, in Smith Township, Mahoning County, has a crooked hole at 3,250 ft., and is drilling.

SUMMARY OF COMPLETIONS

Ohio

	No.	Bbl.	Footage
Oil	7	111	4,237
Gas	21	*16.6	50,892
Dry	4	.....	6,150
Total	32	.....	61,279
Recompletion, oil	1	.....	.....

Indiana

Oil wells	1	38	987
Gas wells	2	*1.14	1,720
Dry holes	1	.....	1,689
Total	5	.....	4,396

Eastern Kentucky

Oil wells	1	25	1,113
Gas wells	2	*2.6	4,199
Total	3	.....	5,312

Western Kentucky

Oil wells	1	30	1,357
Gas wells	1	*0.1	589
Dry holes	3	.....	2,353
Total	5	.....	4,299

*Million cu. ft.

Athens County

Ames Township: Carpenter et al 26 Jane Smith, Sec. 13, 4 bbl., shot, first Cow Run, T.D. 370 ft.
Carthage Township: Ohio Fuel 4 Kate Snodgrass, Sec. 31, 600,000 cu. ft. gas, Berea, T.D. 1,605 ft.

Guernsey County

Adams Township: Roy Early 1 J. Little, Sec. 22, 25,000 cu. ft. gas, Berea, T.D. 1,089 ft.

Cuyahoga County

Mayfield village: Benedum-Trees 1 J. Lockemer, Lot 35, Tract 1, 530,000 cu. ft. gas, Newburg, T.D. 2,820 ft.

Knox County

Butler Township: Ohio Fuel 1 Benton Colgin, Sec. 25, dry, Clinton, T.D. 3,015 ft.
Union Township: Ohio Fuel 1 Victoria Kaylor, Sec. 4, 725,000 cu. ft. gas, Clinton, T.D. 2,862 ft.
J. D. Ewing et al 1 Ellen Majors, Danville corporate limits, 700,000 cu. ft. gas, Clinton sand, T.D. 2,785 ft.
Kuntz Hulse, Inc., 1 Joseph Colopy, Danville corporate limits, 600,000 cu. ft. gas, Clinton sand, T.D. 2,805 ft.

Lawrence County

Windsor Township: Brammer Gas Co. 1 O. E. Brammer heirs, Sec. 32, 300,000 cu. ft. gas, Ohio shales. shot, T.D. 2,734 ft.

Newark Field—Licking County

Mary Ann Township: Allen Willey 1 William Stricker, Sec. 17, 840,000 cu. ft. gas, Clinton, 2,631 ft.
Newton Township: Allen Willey 1 Levi Lynn, Lot 5, first quarter, 3,900,000 cu. ft. gas, Clinton, T.D. 2,684 ft.
C. O. Moore 1 James McGonagle, NE first quarter, 720,000 cu. ft. gas, Clinton, T.D. 2,720 ft.
Newark corporation: James McCloy 1 J. T. Lewis, 681,000 cu. ft. gas, Clinton, T.D. 2,364 ft.
Everett Co. 1 Raccoon Oil Co., 480,000 cu. ft. gas, Clinton, T.D. 2,397 ft.
Everett Co. 1 L. C. Wolfe, 180,000 cu. ft. gas, Clinton, T.D. 2,397 ft.
Perry Township: George Lacknette 4 T. R. Van Allen, Sec. 17, 40,000 cu. ft. gas, Berea, T.D. 735 ft.

Medina County

Chatham Township: Marine Trust Co. 13-A William P. Wertz, Tract 14, Lot 5, 5 bbl., Berea grit, T.D. 416 ft.
Marine Trust Co. 15-A William P. Wertz, 5 bbl., Berea, T.D. 456 ft.
Marine Trust Co. 22-O William P. Wertz, input well, Berea, T.D. 410 ft.
Marine Trust Co. 23-O William P. Wertz, input, Berea, T.D. 422 ft.
Marine Trust Co. 25-O William P. Wertz, input, Berea, T.D. 438 ft.
Marine Trust Co. 26-O William P. Wertz, input, Berea, T.D. 428 ft.
Marine Trust Co. 31-O William P. Wertz, input, Berea, T.D. 415 ft.
Marine Trust Co. 32-O William P. Wertz, input, Berea, T.D. 448 ft.
Marine Trust Co. 33-O William P. Wertz, input, Berea, T.D. 419 ft.
Spencer Township: Ohio Fuel 1 J. W. Johnson, Sec. 11, 3,200,000 cu. ft. gas, Clinton 2,640 ft.
York Township: J. C. Moore 1 Alvin Draper, Lot 6, Tract 6, dry, Berea, T.D. 560 ft.

Meigs County

Lebanon Township: Roy Proffitt 1 Ray Fitch, Sec. 21, 85,000 cu. ft. gas, Berea, shot, T.D. 1,900 ft.
Rutland Township: Ohio Fuel 2 James Nelson, Sec. 22, 1,150,000 cu. ft. gas, Maxon, T.D. 795 ft.
Wilford 1 C. A. Swick, Sec. 19, dry, Mackburg 800-ft. sand, T.D. 735 ft.

Monroe County

Seneca Township: W. E. Riddle 1 L. Yontz, Sec. 20, 50,000 cu. ft. gas, Berea, shot, T.D. 1,632 ft.
Bethel Township: Pure Oil Co. 4 George McFadden, Sec. 4, drilled deeper, 2 bbl., Injun, T.D. 1,309 ft.

Muskingum County

Brush Creek Township: Ohio Fuel 2 fee, Sec. 15, 1,050,000 cu. ft. gas, Clinton, T.D. 4,001 ft.

Noble County

Jackson Township: Skinner Co. 1 James Yarnall, Sec. 10, 4 bbl., Macksburg 800-ft. sand, T.D. 983 ft.

Perry County

Clayton Township: Preston Oil Co. 2 Virgil Williams, SW Sec. 10, 83 bbl. and 100,000 cu. ft. gas, Clinton sand, T.D. 3,365 ft.
Salt Lick Township: Swingle et al 2 George Ricketts, Sec. 18, 10 bbl., Clinton, shot, T.D. 3,168 ft.

Summit County

Green Township: East Ohio 1 K. Nemes, Sec. 29, 150,000 cu. ft. gas, Clinton, shot, T.D. 4,245 ft.

Washington County

Muskingum Township: John L. Wagner 10 Wallace H. Wagner, dry, no oil or gas, Berea grit, T.D. 1,840 ft.

Wayne County

Plain Township: Kemrow Co. 2 Francis Kean, Sec. 32, 590,000 cu. ft. gas, Clinton, T.D. 3,003 ft.

INDIANA

EVANSVILLE, Ind., Mar. 3.—Possibilities of deeper production in the Griffin pool of Gibson County seemed good last week when Continental Oil Co. set casing to test an oil show in the Salem lime at 28 Bozeman, SW SW NE 23-3s-14w. The Salem was topped at 3,256 ft. and, although good saturation was reported, company representatives stated that the lime was tight, with low permeability. Hole was bottomed at 3,526 ft. and 6½-in. casing has been set at 3,506 ft. Cable tools were being moved in at the end of the week to drill plug. This will be the first test of the Salem lime in the Griffin pool.

Continental 15 Keck, SE NE SE 27-3s-14w, southwest of 28 Bozeman, has been plugged back to 3,093 ft. and is being completed in the McClosky. This well for a time promised to add the St. Louis as a pay in the Griffin pool but found this formation too tight for commercial production.

Ed Holemans is still having trouble in shutting off water at 1 Oeth, NE SE NE 6-4s-13w. Three squeeze jobs have failed to shut off water in the McClosky and testing has been unsuccessful so far.

INDIANA COMPLETIONS

Decatur County

Wildcat: Hoosier Public Utilities 220 Veerkamp, SE NE 15-9n-9e, 137,000 cu. ft. gas, 150-qt. shot 889-93 ft., Trenton 886 ft., T.D. 931 ft.

Knox County

Wildcat: Amerlagene, Inc., 1 Moran, N½ Donation 75-3n-9w, dry, Barlow 1,280 ft., Cypress 1,300 ft., Bethel 1,340 ft., Bethel sand 1,350 ft., Aux Vases 1,446 ft., Ste. Genevieve 1,507 ft., water 1,631-42 ft., T.D. 1,689 ft.

Pike County

Bowman pool: Murphy Oil 8 Stewart, SE NW NW 26-1n-9w, pumped 38 bbl., natural, pay 940-87 ft., T.D. 987 ft.

Sullivan County

Sullivan pool: A. S. Reed 1 Coffman, S½ S½ NE 35-8n-10w, 1,000,000 cu. ft. gas, pay 778-89 ft., T.D. 789 ft.

OLD COMPLETIONS NOT PREVIOUSLY REPORTED

Gibson County

Wildcat: Mohawk Drlg. 1 Harmon, NE SE SW 17-3s-11w, dry, T.D. 2,661 ft., completed Dec. 4, 1940.

INDIANA DRILLING REPORT

Blackford County

Harold Clarvine 1 fee.....NW NW NW 16-23n-11e
Location.

Daviess County

Newton P. L. 1 Brittain.....NE NE SW 15-1n-5w
Drilling 3,249 ft.

Gibson County

Oleum Pet. 1 Bank.....SE SE NW 5-2s-8w
S.D. 1,536 ft.
Hyslop et al 1 fee.....NW NE NW 20-1s-9w
S.D. 1,674 ft.
J. P. Shaw 1 Witherspoon .....NE NW 20-1s-11w
S.D. 1,986 ft.

Knox County

C. M. Lane et al 1 Morgan ..... SW SE SW 32-2n-9w
Moving in machine. Cable tools.

La Porte County

Petroleum Service, Ltd., 1 Turczynski .....
SW SW SE 22-37n-1w
Location.

Monroe County

Terry Deskins 1 Kinser.....SW SW NW 34-7n-1e
Spudded and S.D.
Terry Deskins 1 Thompson .....NE NW SE 18-9n-1e
New Albany 675 ft., S.D. 740 ft.

Orange County

United States Oil 1 G. E. Willyard.....
NW NE SW 33-1n-1w
Golconda 55 ft., Bethel 130 ft., Reelsville 195 ft., Beacon Bend 235 ft., Mooretown 250 ft., Paoli 265 ft., Ste. Genevieve 300 ft., drilling 400 ft.

Porter County

F. Jablonski 1 Pluta.....SW NW SW 27-37n-5w
S.D. 280 ft.

Posey County

H. G. Lewis et al 1 New Harmony Realty Co. .....
NW NW NW 6-5s-13w
Golconda 2,416 ft., Barlow 2,592 ft., drilling 2,599 ft.
Holemans 1 Mumford ..... SE NW NE 6-4s-13w
T.D. 2,921 ft., 5-in. 2,914 ft., waiting on cement.
Ed Holemans et al 1 Oeth ..... NE SE NE 6-4s-13w
Set 5-in. 2,951 ft., 20-qt. shot 2,929-35 ft., 450 ft., water in 2 hr., T.D. 2,981 ft.

Sullivan County

E. M. Self 1 James Land .....NE NE NE 36-7n-9w
Spudded and shut down.
W. J. Reynolds 1 Poe.....NE NE SW 3-8n-10w
T.D. 1,477 ft., show oil 1,455-77 ft., will acidize.

Vanderburg County

Harvey Simms et al 1 Heil..... NW NW SW 6-7s-11w
Set 10-in. 88 ft., Providence 250 ft., Mansfield 1,125 ft., base Pennsylvanian 1,577 ft., Menard 1,628 ft., lower Menard 1,698 ft., Waltersburg sand 1,715 ft., 5-in. 1,715 ft., T.D. 1,717 ft., waiting on cement.
T. W. Drake 1 Nurrenbern.....SE NE NE 6-7s-14w
Set 8-in. 391 ft., S.D.

Vigo County

Sage & Farley 1 Campbell....S½ NE NW 24-11n-8w
Set 6-in. 1,553 ft., New Albany 1,552 ft., Devonian 1,655 ft., show oil 1,658-64 ft., T.D. 1,664 ft.

EASTERN KENTUCKY

ASHLAND, Ky., Mar. 3—Completion of a 25-bbl. oil well and two gas wells are included in the report of eastern Kentucky operations this week. Cold weather and some snow apparently have failed to check the

(Continued on Page 79)

By T. R. INGRAM

Sundance Production Found In Test at Wilson Creek

DENVER, Colo., Mar. 3.—Rocky Mountain area was down to two completions and one recompletion for the week. Ohio 9 Agnes Rohiff, in Lance Creek, made 60 bbl. an hour, and Continental 7-A Schuricht, in the same field, was completed for 40 bbl. an hour. Stanolind 1 Rosenberg, Frannie field, was deepened 62 ft. and recompleted for 300 bbl. a day, or double old production.

Texas Co.-California Co. 5 Unit, Wilson Creek, Colorado, is testing 6 ft. of the upper Sundance sand before drilling deeper. Oil is showing and may indicate a discovery in a deeper pay.

Recent gas-well completion of Vermillion Oil 1 Horrocks, north of Hiawatha field, points to a new high

SUMMARY OF COMPLETIONS

Wyoming

	No.	Bbl.	Footage
Oil wells	2	2,500	10,761
Recompletion	1	300	.....

designated as North Hiawatha, and a second test is to be drilled 2 miles to the north.

Cut Bank had two fires at drilling wells. Drilling operations in Osage promise to be on a larger scale and to start earlier than usual this year, due to demand for crude.

New operations include a test to the Sundance in the Berthoud field in Colorado; a deepening operation in Lance Creek in Continental 2-A Schuricht, another deepening at Frannie in Stanolind 6 Rosenberg, a wildcat southeast of Kevin-Sunburst, an outpost on the east side of Oregon basin, two in the Osage district, and one at Mahoney dome.

COLORADO

Boulder County

Bartson Oil 1 Chenberg .....SW SW SE 15-2n-70w
Standing 110 ft., 12½-in. at 65 ft.
J. A. Warren 3 Maxwell..... NW NE NW 24-1n-71w
Drilling 1,285 ft. in sandy shale, show free oil, testing 37.1 gravity.

Larimer County

J. E. Carruthers et al are ready to spud in a test to the Muddy sand and possibly the Sundance in 1 Hogsett in the Berthoud field. Location is 1,980 ft. south and 660 ft. west of the old Five Square Oil & Gas Co. 1 State, SW SW SW 16-4n-69w, completed in January 1931 for 12 bbl. a day in the Muddy sand at 3,735 ft., and still making 10 bbl. a day when pumped intermittently. Several wells have been drilled in the field, one of which was a gas well which for a time supplied Cheyenne, Wyo., with gas, and one or two of which were oil producers for a time. The only deep test was drilled by the old Midwest Refining Co. in 1925 which went to 4,031 ft. It had 3,000,000 cu. ft. of gas and a show for 10 bbl. of oil at 3,700 ft. in the Muddy.

J. E. Carruthers 1 Hogsett.....NE SE NE 20-4n-69w
Ready to spud, first report.

Logan County

West Plains 1 Sheldon.....SE NW SW 3-10n-55w
S.D. 3,415 ft. after lowering 8¼-in. to 3,210 ft. for formation shutoff.

Moffat County

Mountain Fuel Supply 7 Wilson.....
NE SW NW 23-12n-100w
Rigging rotary.

Rio Blanco County

Texas Co. 5 Unit at Wilson Creek, joint with the California Co., is a near completion and is showing for a producer in the Sundance sand. It topped the Sundance at 6,543 ft. and was drilled to 6,549 ft. and is testing in that horizon. Location is ¾ mile northwest of the discovery in the Morrison sand, after plugging off water in the Sundance, and same distance southeast 2 Unit, a producer from the Morrison sand. Following the discovery three wells were drilled some distance out on the north, south, and west sides to test out the Morrison and 5 Unit is the first to be carried down for a further exploration of the Sundance. No figures on what the well is doing have been released.

John Blockhold 10 Government ... Lot 10, 3-1n-102w
Drilling gray shale 125 ft.
Texas-California 5 Unit.....NW NE NE 34-3n-94w
T.D. 6,549 ft., testing.

WYOMING

Big Horn County

McDonald & Curtis 1 Orchard ....SE NW 24-51n-93w
Drilling 1,235 ft. with H.F.W.
N. B. Ketchersid 1 Mann.... SW SW SW 11-55n-97w
Drilling 611 ft.

Carbon County

Sinclair-Wyoming 5-F Mahoney C NW SE 34-26n-88w
Cellar and pits, first report, Mahoney dome.
Ohio 12 State ..... C W½ NE 34-20n-78w
Drilling 2,954 ft.
Sinclair-Wyoming 20 Wertz ... SE SW NE 7-26n-89w
Cemented 13⅜-in. at 447 ft.
Sinclair-Wyoming 4-F Mahoney C SW NW 34-26n-88w
Drilling 4,518 ft. in Tensleep, top 4,408 ft.

Niobrara County

Two completions in Lance Creek were both in proven area.

Ohio 9 Agnes Rohiff, SE NE SE 32-36n-65w, made 60 bbl. an hour through the 2½-in. tubing at 5,385 ft., total depth, from the Leo sand topped at 5,128 ft. The 7-in. was set at 5,383 ft. and perforated with 130 holes at 5,134-5,314 ft. Top of second bench was at 5,270 ft.

Continental 7-A Schuricht, SE NW SW 5-35n-65w, was completed at 5,376 ft., and made 40 bbl. an hour through the 2½-in. tubing from the second bench of the Leo sand after acidizing with 1,000 gal. Top of Leo was at 5,171 ft.

Ohio 6 Otto Rohiff, C SW SW 32-36n-65w, is being recompleted at 5,450 ft., and swabbed 15 bbl. in 2 hours through 24 holes in the 4¾-in. at 5,441-20 ft. Casing was set at 5,446 ft. This is an old Sundance sand well deepened from 3,819 ft. where it was completed in 1936 for 2,200 bbl. a day.

Continental 2-A Schuricht will be deepened to the Leo from the Sundance at 3,872 ft., where it was completed in 1935 for 2,441 bbl. of oil and 3,190,000 cu. ft. of gas.

Continental 2-A Schuricht.....C SE NE 6-35n-65w
T.D. 3,872 ft., rigging to drill deeper.
Ohio 18 Putnam ..... 1,200 ft. E, NW cor. 4-35n-65w
T.D. 5,485 ft., cemented 7-in. at 5,381 ft.
Ohio 19 Putnam.....CWL NW 4-35n-65w
Spudded.
Continental 24 Tom Bell ...NW NW NW 34-36n-65w
T.D. 5,444 ft., cemented 7-in. at 5,275 ft.
Western Petroleum 1 Mosier.....SW SW 31-35n-64w
Building rig.

Park County

Stanolind 1 Rosenberg, NE NE NE 26-38n-98w, Frannie field, was recompleted at 2,887 ft. for 360 bbl. a day on the pump from the Tensleep after deepening from 2,825 ft.

Enalpac Oil 3 Pauline O.P.C.-1, Oregon Basin field, is rigging up for an outside well on east side. It is an east offset to 2 Pauline, completed in 1928 for 300 bbl. a day from the Embar at 3,328-3,745 ft.

Enalpac 3 Pauline O.P.C.-1.....SE SE 5-51n-100w
Rigging up rotary, first report.
Stanolind 6 Rosenberg..... NW NW NW 25-58n-98w
T.D. 2,747 ft., rigging up to deepen, completed 1934 for 300 bbl. a day, now making 150 bbl., Frannie field.
Enalpac Oil & Gas 1 Cactus..SW SE SE 33-51n-100w
Drilling 2,851 ft.

Sublette County

North La Barge Oil 7 Govt. .....C SE NE 28-27n-113w
Location.
Charles Lackey 1 Government NE SE SW 33-27n-113w
Drilling 1,236 ft.
Klumpe Syndicate 1.....NE SW NE 28-27n-113w
Drilling 1,794 ft.
Texas 1-C Government .. SW NW NW 24-27n-113w
Coring 1,127 ft., 800 ft. oil in hole.
Marvel Oil 6 Government.... CEL SE SE 28-27n-113w
Spudded.
North La Barge Oil 6 Govt. . CNL SE NE 28-27n-113w
T.D. 1,120 ft., prepare to test.

Sweetwater County

Vermillion Oil Co., jointly with Johnson & Horton, have made a location for a test in the North Hiawatha district which is of more than ordinary interest. It will be drilled in the NE NE 6-12n-99w, nearly 2 miles to the north and a mile to the east of the Vermillion company's 1 Horrocks, SW SW SW 7-12-99, which was completed last month for 12,000,000 cu. ft. of gas at 3,540 ft. When 1 Horrocks was completed it was considered an extension of the East Hiawatha field, but now it is believed to be on the south flank of a high which has been designated as North Hiawatha, a separate dome on the same line of folding as East Hiawatha and West Hiawatha. The Horrocks well gaged 12,000,000 cu. ft. with a rock pressure of 1,200 lb., the highest pressure of any well drilled in the Hiawatha district. It still had 300 ft. to go to reach the main objective, but was completed at 3,540 ft. on account of the pressure. It is a mile north and a little east of Mountain Fuel Supply 1 Newberry, which was completed in 1929 for 30,000,000 cu. ft. with a pressure of 910 lb. in sand at 2,347-74 ft. The Horrocks well was more than 50 ft. structurally lower than the Newberry well. The latter is on the north side of East Hiawatha.

The Vermillion company has a block of eight sections which run up to the north boundary of Township 12n. Immediately to the north of the block is an east-west major fault which separates North Hiawatha from the Alkali Creek structure.

Vermillion Oil 1 Government . SW NE NE 6-12n-99w
Location, first report.
Sinclair-Wyoming 96-A .....NE SE NE 10-26n-90w
Drilling 1,397 ft.
Sinclair-Wyoming 95-A .....SW NW NW 11-26n-90w
Drilling 3,518 ft.
Rocky Mountain Drlg. 1 State SW SW SW 36-20n-104w
S.D. 3,974 ft., for orders, no oil or gas.
Sinclair-Wyoming 98-A .....NW NW SW 11-26n-90w
T.D. 667 ft., P.B. to 569 ft., swabbed 15 bbl. per hour from Wall Creek, top 390 ft., prepare to pump.
Sinclair-Wyoming 99-A..... SW NW SW 11-26n-90w
Spudded.

Uinta County

Stove Creek Oil 2 Govt. ..... C SW NW 26-14n-119w
Resumed, drilling 1,352 ft.

MONTANA

Glacier County

Two fires at two drilling wells in Cut Bank were the only happenings out of the ordinary. These were at the Santa Rita 2 Jacobson, on which M. R. Wagner has the contract, and the other on the same company's 3 Jordan. The first occurred at 2,600 ft. while the 8-in. was being pulled. The gas became ignited. The derrick, engine, and forge house were saved. In the other the rig was entirely destroyed.

Hannah-Porter 1 Tribal-189.....NW SW SE 19-32n-5w
Spudded, first report.
Santa Rita 3 Jordan ..... C SE NE 7-32n-5w
Standing 585 ft., rig burned down.
A. B. Cobb 3 Tribal-187..... SE SE NW 19-32n-5w
Coring 2,758 ft.
Consolidated Gas 1 Tribal ..... Lot 8, 10-34n-6w
Drilling 680 ft., top Colorado 560 ft., 10¾-in. 570 ft.
Texas 1 Wills.....SW SW NE 19-32n-5w
Drilling 720 ft., top Colorado 520 ft., 10¾-in. 585 ft.
Ed Reagan 1 Tribal-194..... CEL SE NE 22-37n-7w
Drilling 759 ft.

Toole County

Ohio 6 Lind, SW SE NW 11-35n-2w, Kevin-Sunburst, is a near completion at 1,633 ft., where it had 425 ft. of oil in the hole from the Ellis at 1,629-30 ft. It swabbed 22 bbl. natural first 24 hours and then was acidized with 1,000 gal. and is testing. The company did considerable drilling in this district before the days of acidization and is starting two more wells in the Howling pool.

Ohio 6 Howling .....SW SW NW 10-35n-2w
Location, first report.
Ohio 7 Howling..... NE NE SE 10-35n-2w
Location, first report.
Dunkirk Adventure 1 McKechnie NW SW SE 2-31n-1w
Spudded and S.D. to complete rigging, first report, southeast of Kevin-Sunburst.
E. Morton 3 Ellingson.....CNL NE NW 23-35n-3w
S.D. 106 ft.
High Gravity Oil Prod. 1 Govt. SE NW NE 19-35n-3w
T.D. 2,200 ft., P.B. to 2,170 ft., will acidize again.
Kevin Oil 4 Leach.....C SE NE 31-35n-3w
T.D. 1,669 ft., cemented 7-in.
Pfabe & Engleking 13 Govt. . CNL SE SE 19-35n-2w
T.D. 1,518 ft., acidized 500 gal., no results, will shoot and acidize again.
Montana Gas 1-X Nelson ..... CSL SE NE 12-35n-1e
T.D. 2,135 ft., cemented 3-in.

By
L. P. STOCKMAN

Wildcats Head for Horizons Found Below 10,000 ft.

LOS ANGELES, Mar. 3.—At the close of the current week, Standard Oil Co., Tide Water Associated Oil Co., Honolulu Oil Corp., Continental Oil Co., Richfield Oil Corp. and Union Oil Co. had drilled an aggregate of 69,727 ft. of hole in deep tests and have yet to find production. The deepest of this group is 79 Callender of Union in the Dominguez field and this well is the only one that shows any promise. The company is at present bailing and swabbing for production in a zone found at 10,300 ft., below the present productive eighth Callender zone.

At Kettleman North Dome, Standard is still drilling ahead in 1-1-U fee at 11,270 ft. in the Eocene.

Deep-zone possibilities of the Strand field look rather dubious but Tide Water Associated Oil Co. has not concluded work on 25-7-3 Kern County Land which is down 12,618 ft. This well is believed to be in the Vedder zone of lower Miocene age.

Honolulu's 25-P fee in the Buena Vista anticline in the Midway-Sunset field has reached a depth of 12,501 ft. at which point the crews are drilling and coring for the Vedder. At Shafter, Continental Oil Co. is making hole in 2-C Kern County Land at 10,120 ft. but is not yet deep enough to encounter the Vedder sand. Richfield is drilling ahead in 1 Tejon a wildcat in the Tejon-Wheeler Ridge area in the southern end of the San Joaquin Valley at 10,518 ft.

SUMMARY OF COMPLETIONS

	No.	Bbl.	Footage
Oil wells: San Joaquin Valley	6	7,659	46,819
Coastal district	5	2,038	27,062
Los Angeles Basin	4	2,299	14,024
Dry holes	2	.....	3,181
Total	17	.....	91,086

In the Long Beach field, Union Oil Co. has completed 19 Long Beach Community as a small pumping well. It usually requires about 2 weeks for deep wells in the Formax zone to clean up and consequently Union's new well may clean up and improve in production soon. This well is bottomed at 10,894 ft. but is plugged back to 10,582 ft.

Union Oil Co. is grading location for another well to be drilled in the McClung district of Kern County a few miles southeast of the Greeley field and this wildcat will also be a deep one. The hole will probably be carried to at least 11,000 ft. These deep wells indicate the high cost of exploratory work as no wildcat can be abandoned as conclusive unless it is carried down until at least the Vedder has been reached.

SAN JOAQUIN VALLEY

Texas Co. is nearing the objective in 27-13 Southern Pacific in the Canuta district of Fresno County. Top of the Kreyenhagen was found at 7,872 ft. on a drilling break. In the first well drilled in the Cantua district, Texas found the productive zone in sand bodies in middle Hondo and in this well the sand should be found at about 9,320 ft. The initial well of Texas in this area is flowing 15 bbl. of 51-gravity oil cutting 70 per cent through a 1/64-in. bean with a tubing pressure of 150 lb. and a casing pressure of 650 lb. The well is also producing 180,000 cu. ft. of gas which is sufficient to supply the demand of a gas-driven rotary. At least 10 wildcats have been drilled in the Cantua district of Fresno County during the past several years and although several have shown small production of high-gravity oil from the Domengine no production has been of commercial importance.

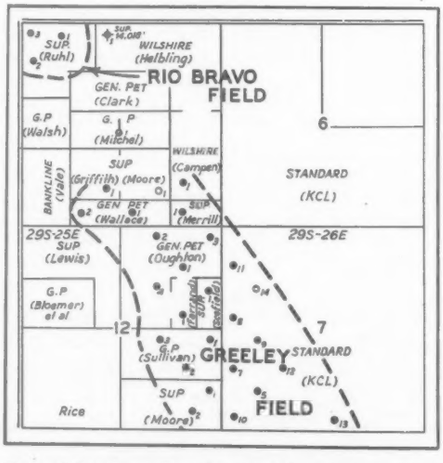
Mount Poso.—In an effort to develop additional supplies of heavy crude oil to meet a definite need, Shell Oil Co. is preparing to drill a wildcat in 11-26s-27e, about 5 miles northwest of the Mount Poso field of Kern County. The Vedder zone which is highly productive in the Mount Poso and Round Mountain fields in the eastern Joaquin Basin is expected to be found around 3,000 ft. The Mount Poso field is entirely developed and will not provide very many additional locations unless the spacing program is changed with the result that operators are obliged to find additional fields in the general area if they desire additional quantities of heavy crude oil. There is plenty of light high-grade refining crude oil but there is a decided shortage of heavy nonrefinable crude to meet the demand for fuel oil.

Round Mountain.—In the Round Mountain field, Trico Oil & Gas Co. received quite a surprise upon the completion of 5 Coffee in 8-28s-29e when the well came in flowing 10 bbl. of 17-gravity oil per hour and gas at a daily rate of 1,000,000 cu. ft. Very few wells in this field show any such quantity of gas and hence it was entirely unexpected. The well died within a short time, however, and it was subsequently put on the beam and finished as a pumping well.

Greeley.—General Petroleum Corp. successfully completed 2 Wallace at Greeley in 1-29s-25e this week and the company's field department breathed a sigh of relief. The company's ground crews did some fast work a week or so ago when they laid 1,000 ft. of steam lines to 3 Sullivan when a boiler explosion left that well without power. Fortunately the drill pipe did not freeze and when power was resumed the crew drilled ahead to 11,510 ft. This well logged top of the Rio Bravo zone at 11,415 ft. and top of the Vedder at 11,463 ft.

The 1-mile undrilled interval between the Greeley and Rio Bravo fields is being consistently narrowed and this has brought up the question as to whether these two fields will join or be separated by a fault or bottle neck. Wilshire 1 Campen, a recent completion which is located between the two fields but a little to the east, definitely indicated the existence of a fault as the Rio Bravo section was entirely missing. The well was finished in the Vedder zone after failing to find the overlying productive Rio Bravo sand.

Coalinga.—Drilling operations in the Northeast and Southeast Coalinga fields which have been restricted will probably undergo another curtailment in the immediate future. The completion of development work in both fields is within sight. Amerada Petroleum Corp. has completed its drilling program in the Northeast Coalinga field with the completion of 24-17 Southern Pacific this week. The initial daily production of this well was 3,140 bbl. of clean 28.3-gravity oil and 2,000,000 cu. ft. of gas from a gun-perforated interval of 10 ft.



General Petroleum Corp. has started an outpost on the Mitchell lease about midway between the Greeley and Rio Bravo fields in Kern County, California. These two fields are only about 1 mile apart and may later be found to join

Standard Oil Co. has started moving northward in the Southeast Coalinga field and its work will determine whether these two fields join or are separated by a converging in the old shore line. Production in the southern end of the Northeast Coalinga field is about 1 mile away from nearest production in the northern end of the Southeast Coalinga field. Most of Standard's fee-owned acreage in this district was acquired in the merger a number of years ago between Southern Pacific and Standard Oil Co.

SAN JOAQUIN VALLEY COMPLETIONS

Coalinga Northeast Field

Amerada 24-17 S.P.L. 17-19s-16e
Flowed 3,150 bbl., 28.3-gravity, 0.7 per cent cut, 2,000,000 cu. ft. gas, 38/64-in. bean. Pressures 1,500/1,500 lb. Elev. 540 ft. T.D. 8,205 ft. 5½-in. combination string cemented 8,205 ft. with 100 sacks cement. Gun perf. open to production 8,185-92 ft. Completed in productive Gatchell zone. Kreyenhagen 7,174 ft., green sand 8,115 ft. Top Gatchell oil sand 8,168 ft. Bottomed in Gatchell oil sand. 33 days' drilling time. Fresno County.

Coalinga Southeast Field

Superior 8-B Cagle 6-20s-16e
Flowed 1,290 bbl., 27.1-gravity, 0.1 per cent cut, 782,000 cu. ft. gas, 48/64-in. bean. Pressures 1,000/1,200 lb. Elev. 684 ft. T.D. 8,224 ft. 8⅝-in. water string cemented 7,940 ft. 306 ft. 6⅝-in. liner landed 8,224 ft. 120-mesh perf. open to production 7,938-8,224 ft. 8,084 ft. 2½-in. tubing. Kreyenhagen 6,675 ft., green sand 7,866 ft., Gatchell oil sand 7,940 ft. Bottomed in Gatchell oil sand of Eocene age. 37 days' drilling time. Fresno County.

Greeley Field

General Pet. Corp. 2 Wallace 1-29s-25e
Flowed 960 bbl., 38.7-gravity, 0.2 per cent cut, 650,000 cu. ft. gas. 18/64-in. bean. Pressures 1,425/1,425 lb. Elevation 336 ft. T.D. 11,510 ft. 5½-in. water string cemented 11,385 ft. 190 ft. 4¾-in. liner landed 11,509 ft. Perf. open to production 11,388-11,509 ft. 11,495 ft. 2-in. tubing. Completed in Rio Bravo zone. 83 days' drilling time. Top Rio Bravo oil sand 11,400 ft. Bottomed in oil sand. Kern County.

Round Mountain Field

Trico O. & G. Co. 5 Coffee 8-28s-29e
Pumped 225 bbl., 17.1-gravity, 2 per cent cut. Elev. 795 ft. T.D. 1,286 ft. 6⅝-in. water string cemented 1,203 ft. 93 ft. 5-in. liner landed 1,286 ft. 80 and 100-mesh perf. open to production 1,205-86 ft. 1,080 ft. 2½-in. tubing. Completed in Vedder zone. 6 days' drilling time. Came in flowing 240 bbl. crude oil and 1,000,000 cu. ft. gas daily rate but died as soon as gas head blown off. Kern County.

Ten Section Field

Shell 74-30-A Kern County Land 30-30s-26e
Flowed 1,866 bbl., 35.1-gravity, 0.4 per cent cut, 2,755,000 cu. ft. gas. 128/64-in. bean. Pressures 300/900 lb. Elev. 329 ft. T.D. 8,210 ft. 4½-in. combination string landed 8,206 ft. and cemented through perf. 7,980 ft. Perf. open to production 7,980-8,085 ft., 8,100-8,206 ft. 7,978 ft. 2½-in. tubing. Completed in productive Stevens oil zone by slim-hole method using 4½-in. tubing as drill pipe. 22 days' drilling time. Top Stevens oil sand 7,780 ft. Bottomed in oil sand. Kern County.

Tupman Field

Richfield 74-29-A Kern County Land 29-30s-25e
Flowed 168 bbl., 40.6-gravity, 5 per cent cut, 1,000,000 cu. ft. gas. 20/64-in. bean. Pressures 400/750 lb. Elev. 312 ft. T.D. 9,384 ft., P.B. 9,356 ft. 8⅝-in. water string cemented 8,667 ft. 735 ft. 6⅝-in. liner landed 9,339 ft. and cemented through perf. 9,058 ft. Perf. open to production 8,689-8,824 ft., 8,869-8,934 ft., 9,062-9,339 ft. 9,200 ft. 2½-in. tubing. Completed in Stevens oil sand. Schlumberger N point 8,451 ft. Top upper zone 8,701 ft. 92 days' drilling time. Kern County.

SAN JOAQUIN VALLEY OUTPOSTS

Coalinga Southeast Field

Standard 48-31-B fee 31-19s-16e
T.D. 612 ft., drilling in surface sand. Fresno County.

Coles Levee Field

Standard 20-8 Kern County Land 5-31s-25e
T.D. 9,595 ft. in Stevens oil sand, shale and gray sand. Swabbed but would not flow. Injected gas and still would not flow. Pulling liner. Top oil sand 8,890 ft. 8⅝-in. casing cemented 8,880 ft. Elev. 430 ft. Kern County.

Elk Hills Field

Standard 42-31-S 31-30s-24e
T.D. 6,281 ft., drilling and coring in sand and shale. Elev. 1,122 ft. Kern County.
Standard 44-29-S 29-30s-24e
Drilling 3,794 ft. Elev. 866 ft. Kern County.

Kettleman North Dome Field

Standard 1-1-U fee 1-23s-16e

Drilling 11,270 ft. in fine sand. Formation test 10,862-11,228 ft. open 24 hr., showed fair steady blow and 3,380 ft. gassy mud and water. Kings County.

Midway-Sunset Field

No. Amer. Oil Consd. 12-8 W.P. 28-32s-23e
Drilling 5,760 ft. in hard shale with streaks of impervious sand. Made only 150 ft. of hole in 7 days. Kern County.

Paloma Field

Western Gulf 12-12-B Kern County Land..12-32s-26e
T.D. 10,752 ft. in Stevens oil sand. Completing. Formation test 10,435 ft. flowed 572 bbl. Kern County.

Strand Field

Associated 25-7-E Kern County Land..... 7-30s-26e
Drilling 12,618 ft. in dry sand. Sand at 11,510 ft. may be Olcese. 9⅝-in. casing 8,885 ft. Kern County.

SAN JOAQUIN VALLEY WILDCATS

Cantua Creek District

Texas 27-13 Southern Pacific.....13-17s-15e
Drilling 8,862 ft. in sand and shale. Elev. 340 ft. Fresno County.

Buena Vista Hills District

Honolulu 25-P fee 10-32s-24e
Drilling 12,500 ft. in shale. Kern County.

Buttonwillow District

Texas 47-15 Southern Pacific 15-29s-24e
T.D. 7,956 ft. Cement fish 6,178-6,536 ft. P.B. 3,200 ft. Redrilling 3,994 ft. Elev. 287 ft. Kern County.

Maricopa District

Bankline Oil Co. 24-24 Sunset 24-11n-23e
Drilling 1,220 ft. in sand and shale. Elev. 970 ft. Kern County.

McClung District

Union 31-3 Kern County Land.....3-30s-26e
Building rig. Kern County.

Mount Poso District

Shell 77-11 Smith 11-26s-27e
Rigging up rotary. Kern County.

Pyramid Hills District

C. C. M. O. Co. 1 Bocqueraz 17-24s-18e
T.D. 1,246 ft. in sandy shale. Reaming to set 6⅝-in. at 750 ft. Kings County.

Shafter District

Continental 2-C Kern County Land 35-27s-24e
Drilling 10,040 ft. in sandy shale. Kern County.

Tejon district

Richfield 1 Tejon ranch 2-10n-19w
Drilling 10,518 ft. in gray Eocene sand and shale. Kern County.

LOS ANGELES BASIN

Standard Oil Co. is drilling ahead in 3-1 Los Angeles Investment which at its present depth, 9,250 ft., is below the Sentous zone found last year by R. R. Bush Oil Co. The formation for the past several hundred feet has been very tight. R. R. Bush Oil Co. finished reconditioning 1 Sentous in the southern end of the structure and then moved to 1 Smith located at the extreme northern end of the field. Rain and difficulties experienced in moving equipment retarded work with the result that 1 Smith is still standing cemented on top of a probable productive oil sand. This well is bottomed at 7,996 ft. and has a 7-in. water string cemented at 7,920 ft. It is the present intention to make a formation test before resuming drilling.

Wilmington.—A week or so ago, the Los Angeles Planning Commission turned down requests for zone variances to drill five new wells north of O Street and west of Avalon Boulevard in the town-lot section of the Wilmington field and the applicants promptly filed a request for reconsideration with the Los Angeles City Council. Early this week the Wilmington Junior Chamber of Commerce addressed a resolution to the city council requesting that body to sustain the commission's disapproval of further drilling expansion in that vicinity.

The territory in question is proved up for small Ranger zone production but due to low drilling costs wells would be considered commercially productive. The Chamber of Commerce has indicated that shipyards in the district require an extension of the residential area to take care of anticipated increase in ship-building activity. The council's decision will be important because of the possibility that Wilmington and Torrance may meet.

LOS ANGELES BASIN COMPLETIONS

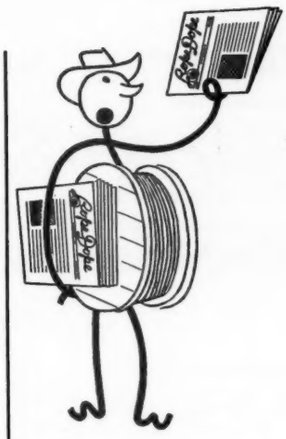
Huntington Beach Field

Signal O. & G. Co. 1 Bolsa Chica 34-5s-11w
Pumped 192 bbl., 28.5-gravity, 3 per cent cut. Elev. 15 ft. T.D. 3,840 ft. 8⅝-in. water string cemented 3,609 ft. and through perf. 981 ft. 245 ft. 6⅝-in. liner landed 3,840 ft. Perf. open to production 3,610-3,840 ft. 3,795 ft. 2½-in. tubing. Completed in Bolsa zone. 48 days' drilling time. Orange County.

Signal O. & G. Co. 22 Bolsa Chica 34-5s-11w
Flowed 1,120 bbl., 29.1-gravity, 0.5 per cent cut. Elev. 14 ft. T.D. 3,405 ft. 8⅝-in. water string cemented 3,002 ft. and through perf. 987 ft. 417 ft. 6⅝-in. liner landed 3,405 ft. Perf. open to production 3,002-3,405 ft. 3,350 ft. 2½-in. tubing. Completed in Bolsa zone. 13 days' drilling time. Orange County.

Wilmington Field

Union Pacific R. R. 33-E Edison.....3-5s-13w
Flowed 852 bbl., 22.9-gravity, 0.2 per cent cut, 180,000



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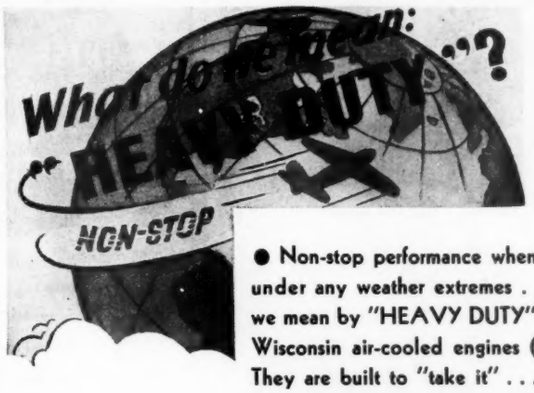

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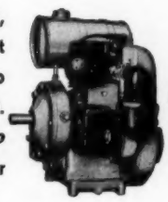

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cu. ft. gas. 42/64-in. bean. Pressures 425/560 lb. Elev. 25 ft. T.D. 2,885 ft., P.B. 2,832 ft. 7-in. water string cemented 2,607 ft. 325 ft. 4-in. gravel-packed liner landed 2,832 ft. Perf. open to production 2,509-11 ft., 2,531-88 ft., 2,608-2,832 ft. 2,480 ft. 2½-in. tubing. Completed in Ranger zone of Pliocene age. 16 days' drilling time. This well located on fee-owned acreage of Union Pacific R. R. Co. but has been whipstocked under transmission line right-of-way of Southern California Edison Co. Los Angeles County.

Union Pacific R. R. 170 fee 3-5s-13w
Flowed 135 bbl., 31.8-gravity, 0.9 per cent cut, 150,000 cu. ft. gas. 38/64-in. bean. Pressures 970/1,120 lb. Elev. 20 ft. T.D. 3,924 ft. 10¾-in. water string cemented 2,561 ft. 1,109 ft. blank 7-in. liner cemented 3,516 ft. 426 ft. 4¾-in. liner landed 3,919 ft. Perf. open to production 3,516-75 ft., 3,595-3,675 ft., 3,700-30 ft., 3,750-3,804 ft., 3,823-3,919 ft. 3,721 ft. 2½-in. tubing including 245 ft. of 2-in. on bottom. Completed in lower Terminal zone. 26 days' drilling time. Los Angeles County.

LOS ANGELES BASIN OUTPOSTS OR DEEP TESTS

Dominguez Field

Union 79 Callender 32-3s-13w
T.D. 12,720 ft. P.B. 10,314 ft. Landed 5½-in. including 291 ft. perf. at 10,310 ft. and cemented through perf. 10,010 ft. Los Angeles County.

Inglewood Field

Standard 3-1 L. A. I. 17-2s-14w
Drilling 9,280 ft. in Miocene sandy shale. Los Angeles County.

R. R. Bush Oil Co. 1 Smith 8-2s-14w
T.D. 7,996 ft. 7-in. casing 7,920 ft. Cleaning out for test. Los Angeles County.

R. R. Bush Oil Co. 1 Merchants 8-2s-14w
Derrick. Los Angeles County.

Long Beach Field

Union 19 L. B. C. 30-4s-12w
T.D. 10,894 ft., P.B. 10,582 ft. Swabbed oil and water. On pumping test showed 70 per cent cut. Los Angeles County.

Rosecrans Field

Southern Cal. Pet. Corp. 1 Townsite 12-3s-14w
Drilling 5,450 ft. in sand and shale. Believed in fault zone. Circulation lost 4,900 ft., 5,050 ft. and 5,125 ft. Los Angeles County.

LOS ANGELES BASIN WILDCATS

Dominguez-Gardena District

Wood-Mellon 1 Wood 31-3s-13w
Taken over by Vesta Petroleum Co. for further work. T.D. 7,795 ft. P.B. 2,400 ft. Redrilled to 6,975 ft. May deepen. Los Angeles County.

Hiles Drilling Co. 1 Grant 29-3s-13w
Pongratz Pet. Co. drilled to T.D. 7,666 ft. and abandoned in 1940. New derrick to deepen. Los Angeles County.

COASTAL DISTRICT

The Newhall-Castaic area is the present scene of another leasing campaign. The recent move of Barnsdall Oil Co. in leasing the county jail farm has indicated that operators consider the Castaic region offers exceptional possibilities from a production standpoint. The unusually large number of anticlinal structures, at least 50, indicates that exploration work will increase. Heavy rains during the past month have retarded development but with the advent of better weather increased drilling is expected.

Western Gulf Oil Co. has staked location for a second well to be drilled on the Lechler lease at Oak Canyon where the company's initial wildcat found a shallow zone productive. This new well will be located west of 1 Lechler and it is the present intention to drill this well as a deep test. Gulf's discovery well in the Oak Canyon field is pumping 50 bbl. of 22.5-gravity oil cutting 13 per cent and appears to be holding rather steady at this figure. In addition to the new work to be started by Western Gulf in the Oak Canyon field, the Hathaway Co. will begin drilling shortly. This company recently staked location for 1 Mazie in 31-5n-17w and intends to proceed with work as soon as roads are firm enough after the recent rains.

Santa Maria.—The demand for heavy nonrefinable crude oil or a crude oil that will yield a maximum amount of residuum will probably lead to considerable additional drilling in the Santa Maria Valley field by Union Oil Co. later this year. This crude oil which comes within the classification of light refinable crude oil yields a maximum amount of fuel oil. In addition to this the company's contract with Pacific Gas & Electric Co. will permit the cracking of this oil to the coke stage to advantage. Pacific Gas & Electric Co. has agreed to purchase Union's coke production at Oleum and will probably begin taking deliveries within the next few months. Union's new coke stills will be completed within another 90 days and will be put into operation along about the middle of May. In the Ventura Avenue field, British American Oil Produc-

(Continued on Page 83)

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TEXAS GULF COAST

Dry-Gas Discovery in Jackson County Extends Wildcatting

By NEIL WILLIAMS

HOUSTON, Mar. 3.—The opening of a dry-gas field in Jackson County, a new sand discovery in the West Ganado field, Jackson County, and the announcement of several interesting wildcat operations were the highlights of development along the Texas Gulf Coast district the past week.

W. S. Boyle and J. G. Mayo 1 Terrell, a wildcat located about 10 miles north of Edna, in the William Murphy Survey, Jackson County, is shut in after flowing dry gas through a 1/2-in. choke with tubing pressure 1,350 lb. and casing pressure 1,650 lb. The well was drilled to a total depth of 6,025 ft. and was completed through perforated casing at 3,788-96 ft. The opening of the field will no doubt broaden the present wildcat play which has been more or less confined to the Marginulina-Frio sands.

SUMMARY OF COMPLETIONS

	No.	Bbl.	Footage
Oil wells: Fields	13	3,865	82,038
Dry holes: Fields	6	.....	38,034
Wildcats	4	.....	28,043
Total	23	.....	148,115

Gas-distillate production from a new and deeper sand was opened in the West Ganado field, Jackson County, as Pure 1 Joe Havran, about 1,200 ft. northeast of the discovery well, flowed ½ bbl. of distillate per hour on a 2-hour drill-stem test from perforated casing at 5,995-6,005 ft. Working pressure built up to 2,000 lb. and 45 ft. of 53.5-gravity distillate was recovered. Tubing is being run for final completion.

La Ward field.—With a second producer completed during the week in the new La Ward field, Jackson County, Humble Oil & Refining Co. announced location for two new wells, both being located south of present production in the A. M. Clare Survey. The locations are 1 Louise Bonnot on a 807.13-acre tract and 1 Mike Strauss situated on a 532.5-acre tract. The second producer for the field is 1 Fred S. Robbins, a south offset to the discovery well. Drilling continues at 2-B Mauritz, northeast of the discovery well, while location was made for 2 Robbins.

Halls Bayou area.—After showing for a distillate producer, Strake Petroleum Co. 1 Griffith, located in the Halls Bayou area, Brazoria County, went dead due to mechanical trouble and tubing is being pulled preparatory to setting a new packer. When tested at 10,328-32 ft., the total depth, the well flowed at the rate of 8 bbl. of 49.3-gravity distillate per hour through a 7/8-in. choke. Tubing pressure was 1,800 lb. After flowing for several hours the well died and tubing pressure dropped from 2,200 lb. to zero in minutes. It is the general opinion that the packer collapsed.

Two Deep Tests Announced

Bailey's Prairie.—Locations for two important deep wildcats were announced for the county. In the Bailey's Prairie area, and located north of the discovery well, Glenn McCarthy et al are building roadway for 1 J. R. Marmion, 694 ft. from the north line and 786.5 ft. from the east line of a 331-acre tract in the Samuel Carter Survey. West of the discovery well of the newly opened Chenango field, Stanolind Oil & Gas Co. prepared to move in material for 1 Vieman in the William Parker Survey. The location is about midway between the field and the Manor Lake area where locations were recently made for a deep test by Pure Oil Co. Location is on a farmout lease from Gulf Oil Corp.

Harris County.—North of Crosby, and located on strike with the Dyersdale field, Harris County, Pure Oil Co. staked location for 1 Chase National Bank, in the John Sellers Survey. The first of several wildcats to be drilled in search of the shallow Marginulina-Frio sands which was started by the opening of the Dyersdale field, was marked up as a failure when H. C. Cockburn abandoned 1 Meyer in the Reuben White Survey at a depth below 5,500 ft.

Other wildcats.—Northwest of the Clay Creek field, in the Merle Community, Burleson County, Haven Oil Co. was moving in material for 1 George Lewis, a projected 6,500-ft. test located in the C. H. Bennett Survey.

Wharton County gained two new wildcat operations as Texas Progress Oil Co. staked location for 1 Sedlack in the Glenflora area in the W. C. Railroad Survey, while in the Lessie area, Lon Cron et al staked location for 1 Helen McGill in the Schwartz Survey.

Along the Wilcox trend and located in the Willis area, Montgomery County, O. C. Garvey 1 Charles Horne, John Sadler Survey, was coring for the Wilcox at the close of the week below 6,723 ft. This well topped the Cockfield at 3,690 ft., Cook Mountain at 5,226 ft., and the Weeches at 6,121 ft.

Superior Oil Co. of California 1 McWhorter, the discovery well of the Magnolia field, Montgomery County, continues to test, and on a recent gage the well made 130 bbl. of 60.5-gravity distillate and a small amount of salt water in 15 hours through a 12/64-in. choke. Tubing pressure was 1,795 lb. The well is testing through perforated casing at 9,212-17 ft.

TEXAS GULF COAST COMPLETIONS

Brazoria County

Manvel field: Texas 30-B W. T. Belcher, 431 bbl., ¼-in. choke, top sand 5,075 ft., T.D. 5,145 ft.
Old Ocean field: Harrison & Abercrombie 2 Wilson, 480 bbl., ¼-in. choke, top sand 10,030 ft., T.D. 10,250 ft.
West Columbia field: Texas 20 Phillips, 508 bbl., ¼-in. choke, perf. casing 5,653-79 ft., T.D. 5,685 ft.
Hogg Oil Co. 5 Hogg, dry, T.D. 4,651 ft.
Wildcat: Fred Browning 1 Rogers, top Marginulina 7,298 ft., Frio 7,480 ft., dry, T.D. 8,008 ft.

Chambers County

Anahuac field: Humble 6-C Drought, dry, T.D. 7,343 ft.
Red Fish Reef field: Humble 223 State, 144 bbl., ¼-in. choke, perf. casing 9,307-12 ft., T.D. 10,924 ft.

Harris County

Dyersdale field: J. W. Frazier 1 J. G. Reid, 298 bbl., ¼-in. choke, top sand 4,054 ft., T.D. 4,862 ft.
Fairbanks field: Amerada-Stanolind 31 Foley, 7 bbl., ½-in. choke, perf. casing 6,844-56 ft., T.D. 8,258 ft.
Wildcat: H. C. Cockburn 1 Hugh Meyer, top Heterostegina 4,792 ft., Marginulina 4,944 ft., Frio 5,010 ft., dry, T.D. 5,511 ft.

Jackson County

La Ward field: Humble 1 F. S. Robbins, 518 bbl., ¼-in. choke, sand 5,211-16 ft., T.D.
Lolita field: Magnolia 5 Mitchell, 176 bbl., 9/64-in. choke, sand 5,933-35 ft., T.D.
West Ranch field: Edmont Oil Co. 1 Ledkins, dry, T.D. 6,010 ft.
Humble 7-B Vanderbilt-State, 384 bbl., ¼-in. choke, perf. casing 5,776-80 ft., T.D. 5,792 ft.
Wildcat: Norsworthy Production Co. 1 Combs, dry, T.D. 6,516 ft.

Jefferson County

Lovells Lake field: Humble 1-C Steinhagen, temporarily abandoned, T.D. 6,788 ft.

Liberty County

Hardin field: Texas 6 Humphreys, 317 bbl., ¼-in. choke, top sand 7,583 ft., T.D. 7,654 ft.

Matagorda County

Buckeye field: United North & South Development Co. 2 Stoddard, dry, T.D. 8,010 ft.
Van Vleck field: Skelly 20-B Cobb, 271 bbl., 5/32-in. choke, perf. casing 7,482-88 ft., T.D. 7,495 ft.

Waller County

Wildcat: John G. Mayo et al 1 Donigan, top Textularia Dibollensis 6,320-50 ft., Discorbis Yeguaensis 6,744-55 ft., Eponides Yeguaensis 6,874-6,904 ft., Cook Mountain 7,518-48 ft., dry, T.D. 8,008 ft.

Wharton County

Hillje field: J. B. Carter 1 Orsak, temporarily abandoned, T.D. 5,238 ft.
Withers field: Texas 89-C Pierce, 132 bbl., ½-in. choke, perf. casing 5,323-38 ft., T.D. 5,323 ft.

(Continued on Page 79)

Permian Basin, Panhandle

(Continued from Page 67)

Shell 13 Roberts, 811 bbl., open tubing, 10,000 gal. acid, 4,980-5,195 ft.
T. & P. Coal & Oil 5 Hall, 1,487 bbl., open tubing, 10,000 gal., 4,910-5,190 ft.
Toddie L. Wynne 1 Willard, old T.D. 5,000 ft., deepened to 5,104 ft., 4,000 gal. acid, new initial 1,560 bbl., open tubing.

NORTHERN WEST TEXAS WILDCAT REPORT

Hockley County

Magnolia 1 M. Wilson, SW cor. Labor 8, Lge. 41, Maverick C.S.L. Sur., 1½ mi. N of production in Slaughter field, drilling 2,480 ft.

King County

J. B. Cunningham 1 F. W. Thormann, NE NE W. C Browder Sur., T.D. 1,680 ft., last report.

Martin County

Magnolia 1 N. D. Teague, NW NW Lab. 10, Lge. 260, Borden C.S.L. Sur., 5,500-ft. test, cementing 8⅝-in. casing 2,850 ft.

Mitchell County

Peck & Croft 1 Jack Smith, 2,173 ft. from N and W lines, Sec. 19, Blk. 26, T.&P. Sur. T.D. 2,400 ft.

TEXAS PANHANDLE

AMARILLO, Tex., Mar. 3.—New work is on the increase in the large Panhandle field. Twelve new locations were staked the past week to bring the total new locations since the first of the year to 135. This is an average of 15 per week for the 9-week period.

Completions in the field totaled eight the past week for a total new initial production of 1,864 bbl.

PANHANDLE COMPLETIONS

(24-hour pumping gages)

Carson County

Cities Service 6 Magnolia fee F, 66 bbl., 195-qt. shot, 3,064-3,130 ft.

Gray County

Wilcox Oil & Gas 48 Combs-Worley, 55 bbl., 600-qt. shot, 2,950-3,100 ft.

Hutchinson County

Kewanee Oil 51 Lewis-Badger, 227 bbl., 370-qt. shot, 2,907-3,003 ft.
McIlroy 7 Tomlinson, 405 bbl., 800-qt. shot, 3,130-3,240 ft.
Shell Oil 11 Harvey B, 267 bbl., 165-qt. shot, 3,008-68 ft.
Skelly Oil 12 Watkins B, 165 bbl., 563-qt. shot, 2,667-2,785 ft.
Travelers Oil 13 Haile B, 575 bbl., 248-qt. shot, 2,985-3,050 ft.

Wheeler County

Harowitz 3 Majors, 104 bbl., natural, 2,424-58 ft.

SOUTHEAST NEW MEXICO

HOBBS, N. M., Mar. 3.—Attention in the Southeast New Mexico district of the Permian basin centered on two exploratory tests the past week, one a wildcat 6 miles west of the Getty field and the other a deep exploratory test in the Shugart area, both in Eddy County.

Sudderth 1 Wills, 1,980 ft. from the south and east lines of Section 14-20-28, is drilling at 600 ft. in lime after being correlated some 90 ft. higher structurally than tests in the Getty field. With an elevation of 3,242 ft., it toppjed the salt at 390 ft. The lime was topped at 545 ft., the point from which the structural correlation was made.

Headed for the deep levels as an exploratory hole, Worth Drilling Co. 1-B Taylor, on the east edge of the Shugart field in Eddy County, was last reported drilling ahead below 4,810 ft. It had missed all pay levels generally found in the area, only slight shows of oil having been found from 4,160-70 ft. and from 4,235-45 ft. Some gas was encountered from 4,270-80 ft., with salt water found from 4,450-60 ft. It is located 1,980 ft. from the north and 660 ft. from the west lines of Section 12-18-31.

SOUTHEAST NEW MEXICO COMPLETIONS

Lea County

Maljamar field: Barney Cockburn 6-A Pearson, NE NE NE 33-17-32, flowed 113 bbl. in 4 hr., open tubing, 300-qt. shot, 3,911-4,061 ft.
Carper Drilling Co. 1-R Simon, NE NE 30-17-32, flowed 600 bbl. daily, open tubing, 240-qt. shot, 3,770-3,860 ft.
W. J. Ritledge, Jr., 1-O Texas Co.-State, SE SW 16-17-32, flowed 83 bbl. daily, open tubing, 100-qt. shot, 3,935-85 ft., plugged back from 4,122 ft., T.D.

SOUTHEAST NEW MEXICO WILDCAT REPORT

Chaves County

L. E. Elliott 1 State ..... NW NE 16-11-31
Top anhydrite high at 1,206 ft., drilling 1,280 ft.
R. T. Wilson 1 L. B. Brown ..... C NW SW 29-11-23
Drilling 821 ft.

Eddy County

Mac T. Anderson 1 Brainard ..... NE NE 28-18-27
Drilling 2,415 ft.
Jones & Yates 1 Everest ..... NE SE 15-18-28
270-qt. shot 1,934-84 ft., and 670-qt. shot 1,485-1,710 ft., set new casing, still testing.
Truett & Tallmadge 1 Rudahl ..... NE SE 2-20-24
Drilling 2,220 ft.
Jones & Yates 1 Pickrell ..... SW SW SW 5-19-26
Drilling 780 ft.
Trojan Oil 1 Grant ..... SW NE 33-20-25
Drilling 2,397 ft.
W. A. Suddreth 1 Willis ..... NW SE 14-20-28
Drilling 600 ft.

Turner Valley Drilling Hits Record High; Production Up

By VICTOR LAURISTON

CHATHAM, Ont., Mar. 1.—Crude production from Alberta in January totaled 787,469 bbl. compared with 722,824 bbl. in December and 471,050 bbl. in January 1940. Comparative figures are:

	Barrels	
	December	January
Turner Valley lime crude	685,601	750,098
Turner Valley limestone gas wells	6,469	3,644
Turner Valley natural gasoline	26,190	27,969
Turner Valley shallow crude	625	642
Red Coulee light crude	1,019	1,014
Wainwright heavy crude	589	831
Miscellaneous	2,331	3,271

The field has 26 weils drilling, a record number, with four on test, and operations now under way are expected to maintain production at the present level of approximately 26,000 bbl. a day throughout 1941.

Allocation Me'hods Suggested

Prior to the March allocation of quotas for Turner Valley crude producers, E. E. Allen, chairman of the Alberta Conservation Board, submitted to operators a number of proposed changes involving a simplification of the allotment procedure first introduced in February. The proposals are:

1. The combination of pressure and productivity factors, heretofore used separately, into one single factor for the computation of only one remaining allotment as compared with the three remaining allotments of February. This will eliminate three complete steps from the allocation procedure as used in February.

2. Elimination of gas-oil ratio as a factor of allocation but full retention of it as a corrective factor. The correction to be made by reducing the first total allotment by a percentage proportional to the average gas-oil ratios for February.

3. Retention of the acreage as a correction factor to apply only to the pressure-productivity factor instead of to any actual allotment.

4. Distribution of any extra war quota to be prorated in proportion to pressure-productivity factors remaining after assignment of remaining allotments and subject to gas-oil ratio correction as described.

North Valley Possibilities

In North Turner Valley, Major Oil Investments 1, LSD 5, 34-20-3w5, has reported the Dalhousie sand around 5,800 ft., indicating the lime may be reached around 6,100 ft. with production as high as 6,550 ft. This would mean that the well, the most northerly test to reach any great depth, has missed the complicated series of faults encountered by nearly every test in North Turner Valley; and bears out the prediction of Dr. J. O. G. Sanderson that toward the north the producing horizon would be reached at shallower depths, which would mean a considerable reduction in drilling costs. Possibilities still farther to the north are being tested by Miracle Royalties 1, LSD 3, Ace Royalties 1, LSD 5, and Major 2, LSD 12, all in 4-21-3w5, and Major 3, LSD 1, 8-21-3w5, involving a northerly extension from Major 1 of almost 2 miles.

Tests in the Foothills

Clearwater structure: Clear Oils 1, LSD 8, 2-35-10w5, resuming in Devonian limestone from 945 ft.

Moose dome: McColl Frontenac Oil 1, LSD 9, 6-23-6w5, below 4,133 ft.

Sarcee Reserve: Inland-Sarcee 1, LSD 2, 4-23-4w5, 1,265 ft., changing to rotary.

Border Fields

Blood Indian Reserve: Northwest-West Petroleums 1, LSD 3, 20-5-23w4, deepening in the Madison from 6,605 ft. after cementing off water.

Del Bonita structure: Shanks Lake Syndicate and Trans-Alberta Oil Co. have each contributed a half section for a joint test with Frederick Taylor and associates, to be located ¾ mile east of Terminal Oil Co. 1 producer.

Vermilion Field

The Vermilion field, inactive through the winter, is preparing for a spring resumption of drilling. A recent survey of the field shows three wells that can be definitely classed as producers. Battleview 2, LSD 13, 20-50-5w4, the crude-discovery well, has been on production since last May, and pumps approximately 40 bbl. Vermilalta-Frankview 2, LSD 4, 20-50-5w4, the only flowing well, has been making 40 bbl. a day since September. Western-Battleview 1, LSD 1, 30-50-5w4, can make 100 bbl. a day on slow-stroke pump, but is shut down part time owing to lack of storage. Crude is shipped to the North Star refinery at Winnipeg.

Ontario Completions

Chatham Township: Union Gas 31, Lot 10, Concession 12, 230,000 cu. ft. at 1,600 ft.

Oneida Township: Union Gas 255 Haldimand, Lot 11, East Plank Road, 19,000 cu. ft. at 628 ft. Schurr & Shank, Lot 18, Concession 3, 135,000 cu. ft.

Walpole Township: Monarch Gas Syndicate, Lot 22, Concession 6, 65,000 cu. ft. a day at 900 ft. P. L. Jackson, Lot 7, Concession 1, 55,000 cu. ft. a day at 1,000 ft. Peacock Oil & Gas-Standard Gas, Lot 13, Concession 1, 35,000 cu. ft. a day at 1,000 ft. F. Reichheld, Lot 8, Concession 5, 12,000 cu. ft. a day at 950 ft.

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Third Trenton Test Started in Centralia; Salem Wells Small

By
STAFF CORRESPONDENT

MATTOON, Ill., Mar. 3.—The third Trenton test in the Centralia field will begin drilling next week in 12-1n-1w. The Algona Oil Co. has announced that it will deepen 1 E. B. Marshall, a Devonian producer at 2,938 ft., to explore the lower lime horizon. The test is located about a half mile west of the pool's second Trenton producer, Allen Borton 1 Storer, which was completed several months ago as a small well.

It is believed that Algona's venture may be the test which will touch off a Trenton boom in the area. The two previous Trenton ventures in the Centralia field made such small producers that other operators did not begin deep tests.

Salem field.—The third Trenton producer in the Salem field, Magnolia 34 Shanafelt, flowed 140 bbl. in 24 hours last week and was given a 135-qt. shot. After the shot, the well made 30 bbl. in approximately 8 hours. The flow will probably increase materially as the hole is cleaned out. Magnolia 37 Shanafelt, which flowed 28 bbl. in 7 hours during drilling operations, was given a 140-qt. shot during the latter part of the week but there has been no production since then. Both wells are near the field's other two Trenton producers in 29-2n-2e. The only other Trenton operation near completion in the field is Mitchell 5 Lee which was drilling plug at the end of the week to test the horizon.

Mount Carmel.—Development in Mount Carmel continued at an increasing pace last week with 17 derricks visible in Mount Carmel and just north of the city limits. Seven wells and one dry hole have been completed and eight wells are drilling in the city at the present time.

SUMMARY OF COMPLETIONS

	No.	Bbl.	Footage
Oil wells: Benton	1	379	2,162
East Calvin	8	2,264	22,588
Hoodville	3	359	9,197
Louden	3	70	4,696
North New Harmony	2	464	5,638
Mount Carmel	7	1,489	15,332
Sandoval	1	750	2,940
Other pools	11	1,066	23,763
Wildcats	1	31	2,989
Dry holes: Fields	5	.....	13,677
Wildcats	14	.....	27,906
Total	56	.....	130,888
Recompletions	6	802	.....

New Horizon Opened at Calvin

A new producing formation was opened in the Calvin pool of White County last week when Duncan 1 Bramlett, NE NE SW SW 17-4s-14w, pumped oil at the rate of 20 bbl. an hour from the Waltersburg sand. Three offsets already have been started. In addition to the Waltersburg, the field has production from five sands, the Tar Springs, Weiler, Aux Vases, Bethel, and a stray sand in the Paint Creek series. The field is also productive from the McClosky lime.

Wildcat tests.—Southern Petroleum Co. 1 McIntosh, NE NW SE 30-4s-8e, was near completion at the end of the week. The well was being cleaned out following a shot in the Aux Vases at 3,205-25 ft. The pay was described as tight, but a commercial well will probably be completed. The 1 McIntosh is an outpost to the Mill Shoals townsite field of northwest White County and may connect the townsite field with the the original Mill Shoals pool.

Fairfield townsite.—The possibility of townsite development at Fairfield in Wayne County was indicated last week when Watkins et al 1 Pfeiffer flowed 27 bbl. of oil in 45 minutes in a drill-stem test of the lower McClosky. Hole is bottomed at 3,332 ft. and the well is being completed in the McClosky lime.

The test is an east offset to H. H. Weinert 1 Hannah, a recently completed Rosiclare producer at 3,280 ft. Watkins' test failed to find saturation in the Rosiclare which is productive in two other small producers in the area and was deepened to the McClosky where good saturation was encountered.

ILLINOIS COMPLETIONS

Bond County

Wildcat: Haines & Jackson 1 Hunter, SW SE SE 1-4n-4w, dry, T.D. 1,501 ft.

Clark County

Martinsville pool: Shawver & Gallatin 1 Howard, SE SE NE 25-10n-14w, pumped 20 bbl., 160-qt. shot 1,340-50 ft., T.D. 1,415 ft.

Clay County

Dundas pool: Pure 3 E. Holtz, E½ NW NE 7-4n-10e, flowed 215 bbl., 5,000 gal. acid, pay 2,877-82 ft., 2,885-90 ft., Fredonia 2,876 ft., T.D. 2,913 ft.

Fayette County

Louden pool: Carter 2 Sloane, NE SE NE 35-9n-3e, pumped 24 bbl. oil and 2 bbl. water, 10-qt. shot 1,534-37 ft., 30-qt. shot 1,534-44 ft., Weiler 1,529-40 ft., T.D. 1,544 ft.

Carter 1 E. Wood, SW NW SW 36-9n-3e, pumped 24 bbl. oil and 8 bbl. water, 10-qt. shot 1,543-46 ft., 15-qt. shot 1,546-51 ft., Cypress sand 1,535-53 ft., T.D. 1,553 ft.

Redwine 6 Rhodes, SE NE SW 18-7n-3e, pumped 22 bbl., 15-qt. shot 1,528-35 ft., 70-qt. shot 1,525-35 ft., Weiler 1,508 ft., T.D. 1,599 ft.

Wildcat: Allied Oil & Youngblood 1 Bonnell, NE NW NE 15-4n-1w, dry, Fredonia 1,617 ft., St. Louis 1,699 ft., T.D. 1,735 ft.

Franklin County

Benton pool: Shell 1 E. McKemie, NW SE SE 24-6s-2e, pumped 379 bbl. oil and 5 bbl. water, 15-qt. shot 2,148-58 ft., Tar Springs sand 2,120-58 ft., T.D. 2,162 ft., P.B. 2,158 ft.

Wildcat: Wegener 1 Old Ben Coal Co., NE SE SE 13-6s-2e, location abandoned.

E. S. Adkins 1-B Orient Coal, SE NE NW 12-7s-2e, pumped 31 bbl. oil and 66 bbl. water, 8-qt. shot 2,054-68 ft., Tar Springs 2,039 ft., T.D. 2,989 ft., P.B. 2,080 ft.

Gallatin County

Omaha pool: Carter 1 S. Rister, SW NE NW 4-8s-8e, pumped 85 bbl., 20-qt. shot 1,718-28 ft., Clore 1,706-30 ft., T.D. 1,730 ft.

Inman pool: W. E. Allund 1 E. Frey, NE SE NW 19-8s-10e, dry, T.D. 1,848 ft., P.B. 1,775 ft.

Hamilton County

Hoodville pool: Carter 2 Strubinger, SE SW NE 27-5s-6e, pumped 152 bbl., natural, Benoist 2,937-60 ft., Aux Vases 3,038-40 ft., T.D. 3,052 ft.

Exchange 1 Friel-A, C E½ 34-5s-6e, pumped 75 bbl. from Benoist, 10-qt. shot 2,940-44 ft., Aux Vases 3,045 ft., no good, old well deepened from 2,980-3,060 ft., P.B. 2,961 ft.

Exchange 16 M. E. Friel-C, NW SE SW 34-5s-6e, pumped 117 bbl., 15-qt. shot 2,977-83 ft., Benoist 2,962-90 ft., 5-qt. shot 3,089-92 ft., Aux Vases 3,065 ft., no good, T.D. 3,100 ft., P.B. 2,975 ft.

Kingwood 7 Morris, SE SE NE 34-5s-6e, pumped 90 bbl. oil and 5 bbl. water, Benoist 2,946 ft., Aux Vases 3,035 ft., T.D. 3,045 ft.

Texas 1 Carrie-Hood Comm., NE SE NW 3-6s-6e, flowed 335 bbl., Benoist 2,955-75 ft., 3,055-60 ft., old well deepened from 3,066-74 ft.

Jasper County

North Boos pool: Pure 1 C. C. Price, W½ SW SW 16-6n-10e, pumped 89 bbl., 5,000 gal. acid, pay 2,792-95 ft., 2,800-05 ft., Fredonia 2,790 ft., T.D. 2,820 ft.

West Liberty pool: Pure 1 Lill Hill, W½ NE SW 17-5n-10e, flowed 197 bbl., 5,000 gal. acid, pay 2,787-92 ft., Fredonia 2,786 ft., T.D. 2,830 ft.

Jefferson County

Roaches pool: Ruwaldt 1 Oysleger, NE SE SE 26-2s-1e, pumped 40 bbl. oil and 40 bbl. water, 15-qt. shot 2,006-21 ft., Benoist 1,991 ft., T.D. 2,021 ft.

Lawrence County

Bridgeport pool: Robinson 1 Sauers, NW SE NW 20-3n-12w, dry, T.D. 5,013 ft.

Madison County

Wildcat: E. A. Gilchrist 1 E. Hasto, NW NW SW 5-5n-5w, dry, Pennsylvanian sand 624 ft., T.D. 810 ft.

Marion County

Fairman pool: Ill. Royalty 1 Brown, NW NW SW 17-3n-1e, dry, Glen Dean 1,106 ft., Renault 1,452 ft., slight show oil 1,452-56 ft., T.D. 1,494 ft.

Shell 10 A. Ververs, W SE NW 18-3n-1e, pumped 115 bbl., natural, Benoist sand 1,421 ft., T.D. 1,430 ft.

Sandoval pool: Southwestern O. & G. 27 Benoist, NE NW NE 8-2n-1e, sw.abbed and flowed 750 bbl., 100 gal. acid, 100 gal. reacid, Devonian 2,883 ft., pay 2,938-40 ft., T.D. 2,940 ft.

Montgomery County

Wildcat: Skiles 1 Neiman, SE SW NE 9-7n-5w, dry, No. 6 Coal 360 ft., base Pennsylvanian 635 ft., Aux Vases sand 725-86 ft., Ste. Genevieve 786 ft., saturation 658 ft., T.D. 863 ft.

Richland County

Noble pool: Pure 14 Wakefield A, SW SE SW 24-4n-9e, pumped 15 bbl. oil and 4 bbl. water, 30-qt. shot 2,615-20 ft., Cypress sand 2,606 ft., T.D. 2,620 ft.

Saline County

Wildcat: Williams 1 A. Smith, SE SW SW 2-10s-6e, dry, Waltersburg 1,598 ft., Tar Springs 1,699 ft., 1,725-35 ft., Glen Dean 1,754 ft., Hardinsburg 1,800 ft., Hardinsburg sand 1,825 ft., Golconda 1,854 ft., T.D. 1,857 ft.

Shelby County

Wildcat: Rose & Durbin 1 Flenner, SW SW SE 9-10n-4e, dry, base Pennsylvanian 1,435 ft., Glen Dean 1,545 ft., Cypress 1,670 ft., Benoist 1,550-65 ft., T.D. 1,702 ft.

Wabash County

Mt. Carmel pool: J. Meyers 1 J. Harris, N½ NW NE 20-1s-12w, pumped 97 bbl., 20-qt. shot 2,051-64 ft., Cypress 2,050 ft., T.D. 2,064 ft.

C. D. Nickens 1 Riggs, SW SE SW 17-1s-12w, pumped 207 bbl., 1,000 gal. acid, 3,000 gal. reacid, McClosky 2,350-54 ft. and 2,376-80 ft., T.D. 2,385 ft.

Shell 1 S. S. Trapp, S WNE NW 17-1s-12w, pumped 96 bbl. oil and 24 bbl. water, Cypress sand 2,072-99 ft., T.D. 2,434 ft., P.B. 2,103 ft.

O'Meara 2 R. E. Smith, N½ NE NE SW 17-1s-12w, pumped 90 bbl., 2,000 gal. acid, perf. 2,074-96 ft., Cypress 2,074 ft., McClosky 2,386-96 ft., T.D. 2,419 ft.

Vickers et al 1 Dr. Couch, NE NE NE NW 20-1s-12w, pumped 164 bbl., 15-qt. shot 2,065-71 ft., Cypress sand 2,055-72 ft., T.D. 2,404 ft., P.B. 2,071 ft.

Hall-Jordan 1 Bruner, SE NW NW 20-1s-12w, pumped 209 bbl., 15-qt. shot 2,065-73 ft., Cypress sand at 2,055-73 ft., T.D. 2,073 ft.

Hall-Jordan 1 Carson-Harrison, NW NW NE 20-1s-12w, pumped 626 bbl., natural, Biehl 1,532 ft., T.D. 1,553 ft.

Southern Pet. 1 C. Schuler, NE SE NW NW 20-1s-12w, dry, Biehl 1,478-85 ft., 1,505-21 ft., 1,523-30 ft., Menard 1,615 ft., Vienna 1,737 ft., Glen Dean 1,832 ft., Golconda 1,832 ft., Barlow 2,022-28 ft., Cypress sand 2,043 ft., Paint Creek 2,135 ft., Benoist 2,178-92 ft., 2,210-30 ft., Renault 2,247 ft., Aux Vases 2,254 ft., Ste. Genevieve 2,334 ft., Rosiclare 2,363 ft., show oil 2,390-94 ft., T.D. 2,400 ft.

Washington County

McKinley pool: DeKalb et al 4 Hundleth, SE NE NW 29-3s-4w, pumped 110 bbl., Benoist 982 ft., Benoist sand 1,002 ft. (no show oil), T.D. 1,037 ft.

Wildcat: R. P. Lester 1 Torren, SW SE SW 21-3s-4w, dry ,Glen Dean 768 ft., Golconda 864 ft., Cypress 984 ft., Paint Creek 1,080 ft., Benoist 1,108 ft., Benoist sand 1,114-38 ft., 1,154-64 ft., Aux Vases 1,192 ft., Aux Vases sand 1,213-20 ft., T.D. 1,220 ft.

Wayne County

Clay City pool: Pure 3 C. Hosselton A, W½ NW SE 21-2n-8e, pumped 75 bbl., Cypress sand 2,628-57 ft., T.D. 2,657 ft.

White County

North New Harmony pool: Superior 1 J. R. Collins, NE SE NW 33-4s-14w, pumped 74 bbl., perf. 2,813-33 ft., 2,684-2,730 ft., 2,575-98 ft., old well P.B. from 3,016-2,919 ft.

Superior 2 E. M. Fitton A, SE SW SE 28-4s-14w, pumped 219 bbl., 20-qt. shot 2,110-42 ft., perf. 2,569-98 ft., 140-qt. shot 2,700-30 ft., Waltersburg 2,112-57 ft., Cypress sand 2,569-2,609 ft., Benoist 2,690-2,730 ft., T.D. 2,730 ft.

Superior 2 E. M. Fitton-B, NW SE SE 28-4s-14w, pumped 245 bbl., 3,000 gal. acid, perf. 2,680-2,727 ft., 2,563-97 ft., 2,550-63 ft., 2,089-2,105 ft., Mc Closky 2,882-86 ft., T.D. 2,908 ft.

East Calvin pool: Arrow 3 Hon B, NW NE SW 33-3s-14w, pumped 140 bbl. oil and 125 bbl. water, perf. 2,893-99 ft., 2,500 gal. acid, McClosky 2,893-99 ft., T.D. 2,913 ft.

W. C. McBride 3 Hon, NW SE SW 33-3s-14w, pumped 159 bbl., 5-qt. shot 2,538-43 ft., 10-qt. shot 2,610-22 ft., Cypress 2,535-47 ft. (saturated), T.D. 2,623 ft.

Yingling 1 Bump, SW SE NW 33-3s-14w, pumped 90 bbl. oil and 90 bbl. water, 2,000 gal. acid, McClosky 2,904-07 ft., T.D. 2,907 ft.

Buell & Herndon 1 J. J. Bond, SE SE NE 8-4s-14w, pumped 80 bbl., 30-qt. shot 2,802-17 ft., Aux Vases sand 2,802-17 ft., old well deepened from 2,697-2,817 ft.

Cherry & Kidd 4 Calvin, NW NE NE 8-4s-14w, pumped 42 bbl., 50-qt. shot 2,805-30 ft., Aux Vases 2,805-30 ft., old well P.B. from 2,938-2,830 ft.

Burr Lambert 7 Calvin, SE NE SW 9-4s-14w, pumped 95 bbl., 60-qt. shot 2,828-54 ft., Aux Vases sand 2,828 ft., T.D. 2,856 ft.

Delta Drlg. 5 Boltinghouse, NE SW NW 16-4s-14w, flowed 1,200 bbl., 80-qt. shot 2,824-53 ft., Aux Vases sand 2,823-51 ft., T.D. 2,856 ft.

P. Miller 1 C. Ford, NW SW SW 16-4s-14w, pumped 120 bbl., 50-qt. shot in Cypress 2,691-2,725 ft., T.D. 2,725 ft.

W. Duncan 6-B C. C. Hughes, SE NE SE 17-4s-14w, flowed 190 bbl. in 16 hr., 40-qt. shot 2,821-50 ft., Aux Vases 2,814 ft., T.D. 2,851 ft.

W. Duncan 8-B Hughes, SE SE SE 17-4s-14w, flowed 270 bbl., 40-qt. shot 2,830-50 ft., Aux Vases sand 2,822-40 ft., T.D. 2,857 ft.

South New Harmony: Burr Lambert 1 Golden, SW NE NE 29-5s-14w, dry, Menard 2,237 ft., Waltersburg 2,366 ft., Tar Springs 2,408 ft., Glen Dean 2,505 ft., Golconda 2,606 ft., Barlow 2,739 ft., Cypress sand 2,750 ft., Paint Creek 2,842 ft., Aux Vases sand 2,900 ft., T.D. 2,922 ft., P.B. 2,400 ft.

West Irons pool: Vanderbark 1 Johnson, SE SW NE 23-6s-8e, pumped 196 bbl., perf. 2,443-53 ft. in Tar Springs, old well worked over, old T.D. 3,184 ft.
Storms pool: Smokey 2 Wilson B, NW SW NE 11-6s-9e, pumped 105 bbl. oil and 26 bbl. water, Waltersburg sand 2,273 ft., T.D. 2,290 ft.
Wildcat: Skelly 1 E. Winter, NW NW SW 18-4s-10e, dry, Ste. Genevieve 3,133 ft., St. Louis 3,307 ft., T.D. 3,317 ft.
R. Warren 1 Brimbe-Combe, SE SE NW 36-5s-9e, dry, Hardinsburg 2,607 ft., Golconda 2,641 ft., Barlow 2,758-63 ft., Cypress sand 2,803-48 ft., show oil, Paint Creek 2,889 ft., Benoist 2,918 ft., Benoist sand 2,957-79 ft., Renault 2,987 ft., Aux Vases sand 3,054-74 ft., Ste. Genevieve 3,108 ft., Rosiclare 3,122 ft., Fredonia 3,132 ft., McClosky 3,153-58 ft., T.D. 3,267 ft.
Horton & Wiggins 1 J. G. Bradley, SE SE NW 32-6s-10e, dry, T.D. 3,120 ft.
Eason 1 DeLaff, NE SW NW 8-7s-8e, dry, Benoist 2,810 ft., Aux Vases 2,855 ft., Ste. Genevieve 2,885 ft., Fredonia 2,988 ft., St. Louis 3,130 ft., T.D. 3,195 ft.
Brehm & Darlen 1 Creek, SW NW NW 29-6s-10e, dry, Menard 2,220 ft., Vienna 2,383-90 ft., Tar Springs 2,430 ft., Glen Dean 2,466 ft., base Golconda 2,680 ft., Cypress sand 2,705-27 ft., slight show oil, Aux Vases 2,885-97 ft., slight show oil, Ste. Genevieve 2,995 ft., T.D. 3,135 ft.

Williamson County

Wildcat: Scott et al 1 Throckmorton, NE SE NW 29-10s-2e, dry, Rosiclare 1,928-40 ft., show oil, Fredonia 1,963 ft., McClosky 1,966-68 ft., T.D. 2,029 ft., P.B. 1,816 ft.

Whiteside County

Wildcat: J. S. Feltus 1 Hopkins, NW NE NE 35-21n-6e, dry, T.D. 155 ft.

ILLINOIS DRILLING REPORT

Bond County

Thomas Scharf et al 1 Calufetti .. SE SW NE 27-7n-4w S.D. 250 ft.
Woodruff 1 Harwood ..... NE NE SE 36-7n-4w Set 6-in. 600 ft., waiting on cement.

Clark County

Stewart 1 Wallis ..... NW SW SE 8-10n-14w Drilling 235 ft.

Clay County

Bradshaw Drlg. (was Dedman) 1 Crews est. ..... NE NE NW 9-4n-5e Machinery on ground.

Clinton County

B. E. Martin 1 C. Heinzman ..... SE SE SE 4-2n-1w Moving in cable tools.
P. Mosebach 1 Schlarman ..... NE NW NW 9-1n-3w Rig.
Hughes 2 Holman ..... NE SW SE 10-2n-1w Drilling 1,320 ft.
J. F. Ashoff 1 Lampen ..... NW NW NW 16-1n-2w S.D. 925 ft.

Crawford County

Cullin 1 Kirtland ..... NE NW 7-6n-13w Rigging up rotary tools.

Edwards County

Noah & Morrison 1 Smith ..... NE SW SE 12-2s-10e Bridgeport 1,577 ft., drill-stem test 1,577-92 ft., received 90 ft. oil and 980 ft. water in 30 min., drilling 1,790 ft.
Seaboard 1 Bragham ..... SE SE SW 3-1n-14w Set 10-in. 114 ft., drilling 1,486 ft.
Roy Powers et al 1 Strauss ..... E½ SE SW 4-1s-14w Drilling 2,390 ft.

Fayette County

Turner Drlg. 1 Williams..... SW SW NW 6-6n-2e Drilling 75 ft.
H. R. Spires 1 Braasch ..... NE NE SW 1-5n-2e Rigged up rotary tools and S.D.

Ford County

Nelson et al 1 Erp ..... SW NW SE 19-24n-7e Drilling 2,583 ft.

Gallatin County

Seaboard 1 Colnon ..... NW NW SE 4-8s-8e Lower Kincaid 1,504-34 ft., Clore 1,638 ft., Palestine 1,707 ft., drill-stem test 1,707-20 ft., received 140 ft. oil and 40 ft. mud in 30 min., est 7-in. 1,706 ft., waiting on cement.
Sun 1 C. W. Patton ..... NW NE NE 4-8s-8e Palestine 1,741 ft., Menard 1,796 ft., Waltersburg 1,887 ft., Waltersburg sand 1,892-1,920 ft., Glen Dean 2,046 ft., Hardinsburg 2,099 ft., Golconda 2,184 ft., Cypress sand 2,359 ft., drill-stem test 1,728-62 ft., received 15 ft. oil and 550 ft. water in 30 min., coring 2,391 ft.

Fulton County

Lee Township Oil 1 Quigle ..... SE SW NE 14-7n-1e Drilling 230 ft.

Hamilton County

D. & P. Oil 1 Zellars ..... SW NE SW 26-3s-5e No. 6 Coal 1,195 ft., Pennsylvanian sand 1,360 ft., Biehl 1,625-85 ft., slight show oil in top, drilling 2,250 ft.

Hancock County

Sam Tate et al 1 J. Rice ..... SW NE NW 28-4n-5w S.D. 1,912 ft.

Jackson County

Barton & Shipman 1 P. Maharry . NE NE SE 20-9s-3w Drilling 1,010 ft.

Jasper County

Carl Buerkle et al 1 Payne ..... SE NE NE 6-5n-10e Rig.
Pure 1 F. J. Ochs A ..... W½ NW SW 23-6n-10e Set 8⅝-in. 228 ft., waiting on cement.

Jefferson County

Obering 1 Morgan ..... NW SE SW 25-2s-1e Spud.
Regent 1 Luchsinger ..... SW NE SE 3-1s-2e Menard 1,438 ft., Glen Dean 1,655 ft., Cypress 1,834 ft., Benoist 1,980 ft., T.D. 1,992 ft., set 5½-in. 1,977 ft., waiting on cement.

Johnson County

Benedum-Trees 1 Cavitt ..... SW SW NW 24-11s-3e Drilling 3,671 ft.

Lawrence County

W. Payne 1 H. Payne ..... NW SW NW 20-3n-11w Drilling 1,185 ft.

McLean County

Funks Grove O. & G. 1 Crawford NW NW NW 28-22n-1e Drilling 1,921 ft.

Macoupin County

Bridges & Valbert 1 Feiker ..... NW NE SW 1-9n-7w Fredonia 618 ft., St. Louis 832 ft., sand 1,125-65 ft., lime 1,180 ft., water 1,145-55 ft., show gas 1,175-80 ft., S.D. 1,180 ft.
Adams & Laegers 1 Bristow SW SW SW NW 8-11n-7w Drilling 350 ft.

Montgomery County

Ben Turelli 1 Mandhink ..... NE NW SE 32-10n-4w Rigging up machine.

Madison County

Alch & Carroll 1 Rinkel ..... SE NE NW 33-5n-6w Drilling 874 ft.

Marion County

J. Dunbar 1 Fischner ..... SW SW 27-3n-1e Drilling 310 ft.

Randolph County

J. R. Rankin 1 B. Bierman ..... SW SW SE 3-7s-5w Drilling 638 ft.

Saline County

Diggs, trustee, 1 Loomis Hardesty, W½ NE SW 20-7s-5e Kincaid 1,894 ft., Degonia 2,030 ft., Clore 2,088 ft., Palestine 2,170 ft., Menard 2,270 ft., drilling 2,510 ft.

Shelby County

Stewart 1 McGarr ..... NE NE SW 26-12n-2e Set 10-in. 90 ft., drilling 1,220 ft.

Wabash County

Troop Heyle 1 Dager ..... SE NE SW 31-2n-11w Palestine 1,305 ft., Menard 1,345 ft., Waltersburg 1,435 ft., Vienna 1,489 ft., Tar Springs 1,505 ft., Glen Dean 1,643 ft., Hardinsburg 1,683 ft., Golconda 1,705 ft., Barlow 1,808 ft., Cypress sand 1,854-59 ft., 1,865-68 ft., Paint Creek 1,905 ft., Benoist 1,967 ft., Renault 1,999 ft., drilling 2,014 ft.
J. E. Baver 1 Sanders ..... SW NE NW 6-1n-11w Rig.
E. O. Olds 1 Parkinson .... NW NW SW NE 29-1s-12w Drilling 1,845 ft.
Hayes & Yingling 1 Tanquary....NE SE SE 26-1s-14w Waltersburg 2,163-73 ft., Vienna 2,236 ft., Tar Springs 2,270 ft., Glen Dean 2,332 ft., Hardinsburg 2,379 ft., Golconda 2,452 ft., Barlow 2,572-2,605 ft., Cypress 2,676-90 ft., Benoist 2,702-60 ft., Renault 2,760 ft., Aux Vases 2,849 ft., Ste. Genevieve 2,876 ft., McClosky 2,903-16 ft., S.D. 3,002 ft.
Harvey & Lobre 1 Strine .... NW NE NW 13-1n-14w Location.
F. A. Farrell 1 J. W. Price est .. SW SE NE 14-1n-12w Drilling 700 ft.
Harr-Jordan 1 Wise ..... SE SE SE 30-1s-12w Rig.

Wayne County

Carl Robinson 1 C. K. Bathwell .W½ NW SE 25-2s-8e West Franklin 665 ft., base Pennsylvanian 2,200 ft., Kincaid 2,247 ft., Palestine 2,380 ft., Menard 2,480 ft., Waltersburg 2,525 ft., Waltersburg sand 2,530 ft., Tar Springs 2,605 ft., Tar Springs sand 2,620 ft., Glen Dean 2,715 ft., Golconda 2,873 ft., Barlow 2,965-73 ft., Cypress sand 2,983-3,003 ft., Renault 3,249 ft., drilling 3,293 ft.

White County

Travis 1 Davis ..... SE SW NE 30-4s-9e Moving in rotary tools.
G. R. Hays Drlg. 1 Ackerman .NW NW NW 32-5s-14w Kincaid 1,890 ft., lower Kincaid 2,000 ft., drilling 2,040 ft.
Jackson et al 1 W. A. Hamilton.. SW SE SW 13-7s-8e West Franklin 378 ft., base Pennsylvanian 1,776 ft., Degonia 1,920 ft., Clore 1,970 ft., drilling 2,045 ft.

Williamson County

Adkins 1-D Old Ben Coal Co. ..... SE SE SE 4-8s-2e Tar Springs 1,836 ft., show oil, Glen Dean 1,907 ft., Golconda 2,039 ft., Cypress 2,190 ft., Cypress sand 2,207-25 ft., Benoist 2,428 ft., Renault 2,447 ft., Aux Vases 2,464 ft., Ste. Genevieve 2,515 ft., Rosiclare 2,549 ft., Fredonia 2,628 ft., drilling 2,724 ft.

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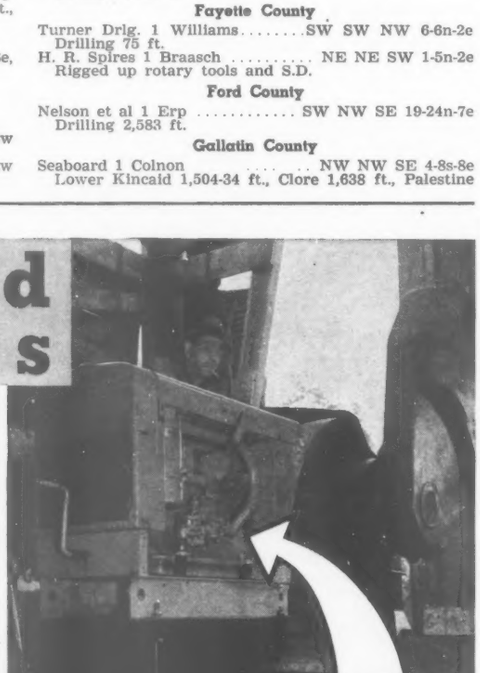

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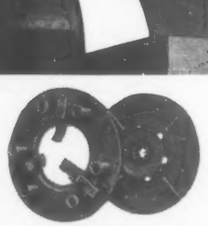

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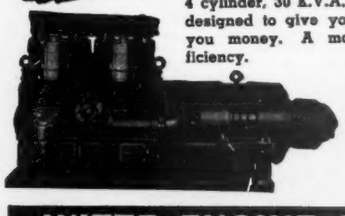

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Lowry Prospect Test Opens New Distillate Structure

By F. L. SINGLETON

NEW ORLEANS, La., Mar. 3.—The Lowry prospect, Cameron Parish, was added to the list of gas-distillate structures in the Louisiana Gulf Coast district as Lisbon-Iberia Oil Co. 1 Calcasieu National Bank was flowing at the estimated rate of 3 to 4 bbl. of distillate per hour, and an estimated 4,000,000 cu. ft. of gas per day while testing through ⅛-in. choke from perforated casing at 9,970-75 ft. Tubing pressure was reported at 3,500 lb.

This well has been looked upon as a probable pool opener for several months as an electrical survey and drill-stem testing in several sand sections showed favorable results. Six-inch casing was cemented several weeks ago at 10,215 ft., and the well was drilled to a total depth of 10,685 ft. before the hole was plugged back for testing. Drill-stem testing through casing perforated at 10,055-60 ft., recovered gas, distillate and water. Other sands were logged at intervals from 8,700-9,800 ft., and these may be tested before final completion is made.

The well is located in 19-12s-4w, about 10 miles northwest of the Grand Lake field, about 12 miles south of the South Roanoke field in Jefferson Davis Parish, another distillate type field. The discovery well is located between two dry holes that were drilled by Pure Oil Co. several years ago. Principal lease holder in the area other than Lisbon-Iberia is Superior Oil Co. of California.

SUMMARY OF COMPLETIONS

	No.	Bbl.	Footage
Oil wells: Fields	17	3,532	128,318
Dry holes: Fields	1	.....	8,966
Dry holes: Wildcats	1	.....	11,010
Total	19	.....	148,294

Basile area.—Bering Oil Co. 1 Fruge, an interesting Wilcox test located in the Basile area, Evangeline Parish, has been marked off the list as a dry hole at a depth below 8,000 ft. This well was reported last week to be running structurally high. Interest in the trend is now centered on the Glenmora area, Rapides Parish, as Crosby Drilling Co. 1 Phillips cored below the Wilcox with no shows reported. Top of the Cane River was reported at 7,315 ft., and the first large Cyclammina was logged at 7,649 ft. The Wilcox section was topped at approximately 7,847-48 ft., and coring from 7,750-7,858 ft. failed to find any saturation.

Pine Prairie.—Location for another wildcat was made in the old Pine Prairie prospect, Evangeline Parish, by Hebert & Smith for 1 Evangeline Land & Mineral Co. in 37-3s-1w. Since the opening of production from the Wilcox, this prospect has received wide attention and the area has been worked at various times with geophysical instruments with the result that many of the companies holding protection in the area are supporting the present well which is expected to be drilled to a depth below 9,500 ft.

Pine Prairie is an old salt dome structure which has produced some oil from shallow horizons on top of the structure. It is also reported that tentative location for another Wilcox test has been made in the Kinder Allen Parish which has, within the past few months, received an active leasing campaign.

Test holes.—In St. Bernard Parish, and located in the Kenilworth field, Vendome Petroleum Co. 1 Kenilworth is bottomed at 10,648 ft., and 7-in. casing was cemented at 10,620 ft. An electrical survey showed sand at 10,353-65 ft., and side-wall cores of the section recovered sand with an oil odor. This is the third well to be drilled since the field's discovery being located south of two dry holes.

Amerada 1 Wilberts, a wildcat located on the Port Allen prospect, West Baton Rouge Parish, is drilling in shale below 8,008 ft. with no shows reported. The well is running structurally lower than wells in the University field, East Baton Rouge Parish, and slightly higher than Humble 1 Levert, a dry hole.

Tide Water 1 State, an outpost test located north of the discovery well of the West Bay field, Plaquemines Parish, is shut down waiting on orders at a total depth of 7,300 ft. Two feet of sand with an oil show was recovered in a core at 7,260-72 ft., while 3 ft. of shale and sand with an oil odor was logged at 7,272-86 ft. An electrical survey showed that the 7,200-ft. discovery sand had faulted out, and the well may be abandoned at its present depth.

St. Gabriel field.—The newly opened St. Gabriel field, Iberville Parish, is due to receive an early development program as locations for four new wells were announced by George Echols who opened the field the previous week. Derrick is being built for 2-A Natalbany Lumber Co., a north offset to the discovery well, while 1-B, 1-C and 1-A Gueymard are to be drilled, respectively, southwest, west and southeast of the discovery. The discovery well, 1 Natalbany Lumber Co., was completed the previous week at 7,766-76 ft. for an initial production of 250 bbl. daily through a 9/64-in. choke.

Moss Lake.—On the east side of Moss Lake, Calcasieu Parish, J. S. Neilson is reported to have assembled a block of approximately 4,000 acres. The block is in an area where several dry holes have been drilled by various companies during the past few years. In the south-central part of the parish, a geophysical option is reported to have been taken on some 25,000 acres consisting largely of land controlled by the Sweet Lake & Land Co., and the Farmers Land Co.

LOUISIANA GULF COAST COMPLETIONS

Calcasieu Parish

Iowa field: Magnolia 17 Wait, 512 bbl., 12/64-in. choke, perf. casing 7,613-21 ft., T.D. 7,625 ft.

Cameron Parish

Magnolia 30 Cameron Meadows, 395 bbl., ¼-in. choke, perf. casing 5,712-22 ft., T.D. 5,725 ft.
West Hackberry field: Superior Oil Co. of California 1-A Raymon Vincent, 150 bbl., 9/64-in. choke, perf. casing 8,394-8,536 ft., T.D. 9,001 ft.
Sweet Lake field: Pure 21 Yount Lee, 138 bbl., 32/64-in. choke, perf. casing 7,250-55 ft., T.D. 7,788 ft.

Evangeline Parish

Ville Platte field: Continental 5 Fontenot, Tr., 1, 81 bbl., ⅞-in. choke, perf. casing 8,917-36 ft., T.D. 10,064 ft.
Continental 7 Tate, 245 bbl., ⅞-in. choke, perf. casing 9,966-80 ft., T.D. 10,137 ft.
Danciger 2 Pitre, 295 bbl., 12/64-in. choke, perf. casing 10,085-10,106 ft., T.D. 10,147 ft.

Iberia Parish

Bayou Pigeon field: Plymouth 1 Tilly, 334 bbl., 9/64-in. choke, perf. casing 8,142-53 ft., T.D. 8,372 ft.
New Iberia field: William Helis 4-H Bolivar, 32 bbl., ½-in. choke, sand 1,002-50 ft., T.D. 1,874 ft.

Iberville Parish

St. Gabriel field: Titanic 1 Natalbany Lumber Co., 238 bbl., 9/64-in. choke, perf. casing 7,766-76 ft., T.D. 9,031 ft.

Jefferson Davis Parish

Continental 1 Jaenke, 36 bbl., 5/32-in. choke, perf. casing 8,504-20 ft., T.D. 11,535 ft.

La Fourche Parish

Golden Meadow field: Brown-Woods & Co. 1 Dantin, 179 bbl., 10/64-in. choke, perf. casing 5,430-40 ft., T.D. 5,503 ft.
Leeville field: Texas 81 Leeville, 291 bbl., 10/64-in. choke, perf. choke 7,782-7,810 ft., T.D. 8,093 ft.

St. Landry Parish

Port Barre field: Pan American 8 Garland, 265 bbl., 5/32-in. choke, perf. casing 5,955-70 ft., T.D. 5,583 ft.

St. Martin Parish

Anse La Butte field: W. R. Davis 1 Voorhies, dry, T.D. 8,966 ft.
Iberia Petroleum Co. 4-A Moresi, 100 bbl., pumping, sand 1,151-81 ft., T.D. 2,448 ft.
Stanolind 3 Bergeron, 203 bbl., 10/64-in. choke, perf. casing 4,771-88 ft., T.D. 4,826 ft.

Terrebonne Parish

Wildcat: Stanolind 1 Continental Land & Fur Co., dry, T.D. 11,010 ft.

Vermilion Parish

Continental 1 C. P. Motty, 38 bbl., ⅛-in. choke, perf. casing 10,318-44 ft., T.D. 10,566 ft.

LOUISIANA GULF COAST DRILLING REPORT

Calcasieu Parish

Gulf 1 Calcasieu National Bank, Hayes prospect, 18-11s-5w, drilling shale 8,586 ft.

Iberia Parish

Gulf 1 Petit Anse Co., Avery Island dome, drilling sandy shale 10,766 ft.

Jefferson Parish

Reese B. Carter 1 Cravens, Westwego area, drilling shale 8,580 ft.

Plaquemines Parish

Phillips 1 State-Bastian Bay, 48-20s-29e, drilling shale 10,075 ft.
Texas 1 State-Delacroix, 34-15s-15e, drilling shale 9,120 ft.
Texas 1 State-Octave Pass, 32-20s-20e, drilling shale 10,830 ft.

St. Bernard Parish

California and Tide Water 1 Biloxi Marsh Lands Co., drilling shale and lime 10,873 ft.

St. Martin Parish

Shell 1 State-Duck Lake, 1-15s-11e, drilling shale 9,678 ft.

St. Mary Parish

Humble 1 Miami Corp., 15-15s-6e, drilling shale 9,987 ft.

St. Tammany Parish

W. T. Burton 5 State-Lake Ponchartrain, S.D. 8,370 ft.
W. T. Burton 6 State-Lake Ponchartrain, driving piling.

Texas Gulf Coast

(Continued from Page 75)

Texas 90-C Pierce, 120 bbl., ¼-in. choke, perf. casing 5,346-62 ft., T.D. 5,376 ft.

TEXAS GULF COAST DRILLING REPORT

Brazoria County

Pure 1 Greenameyer, Manor Lake area, H.T.&B. Sur., rigging up.
J. Newton Rayzor 2 Christian, Chenango field, drilling shale 5,720 ft.

Hardin County

W. G. Christian 1 Gueydry, M. Chavans Sur., drilling shale 7,115 ft.
Republic 1 Elliott, 1 mile southwest of Silsbee field, drilling shale 3,847 ft.

Harris County

Sun 1 Foster Lumber Co., northeast of Humble field, A. Turner Sur., drilling shale 5,770 ft.

Jefferson County

British American 2-71 State, Gulf of Mexico, drilling shale 5,773 ft.

Liberty County

George Echols 2 Boyt, Double Gum area, H.&T.C. Sur. No. 9, drilling shale 7,630 ft.
H. E. Dishman et al 1 C. J. Robertson, Tanner's Bayou area, A. M. de La Jarza Sur., drilling shale 1,940 ft.

Matagorda County

Stanolind 1 Huebner, E. Hall Sur., drilling shale 9,015 ft.

Wharton County

R. O. Lowrance 1 Juhl, B.S.&F. Sur., Sec. 14, T.D. 7,250 ft., drill stem stuck.

Kentucky Fields

(Continued from Page 70)

general activity and current operations point to a probable spring pickup.

Cumberland Petroleum's deep test on the L. C. Bailey tract at State Road Fork in Magoffin County is reported at 4,041-ft. mark. Drilling in this well, No. 44, was resumed after a first-of-the-week shutdown. Located in the Oil Springs region, not far from the original discovery well, the operation is being watched with deep interest and several concerns are backing the test. The Oil Springs field has been intensively developed in past years.

EASTERN KENTUCKY COMPLETIONS

Martin County

Virginia Gasoline & Oil 5 W. H. Blankenship, on Rockcastle Fork of Wolfe Creek, 25 bbl., natural, at 1,113 ft.
Kentucky-West Virginia Gas Co. 5284 J. G. Carlisle, on Coldwater Branch, 377,000 cu. ft. at 2,950 ft., shale, 330 lb. R.P., 24 hr.

Floyd County

Kentucky-W. Va. Gas 609 M. A. Davidson, Daniels Creek of Levisa Fork, 2,268,000 cu. ft. at 1,249 ft. in Big lime.

WESTERN KENTUCKY

Daviess County

Utica district: Creek Drilling Co. 9 Gus Morgan, 30 bbl., 20-qt. shot, Jones sand 1,194-98 ft., 60-qt. shot Barlow sand 1,334-57 ft.
Farmer et al 7 F. B. Nation, moving in.
Whitesville district: O. D. Vickers et al 3 Frank Foor, 100,000 cu. ft. gas, Jett sand 520-76 ft., T.D. 580 ft., abandoned.

McLean County

Livermore district: Koffman & Bollinger 10 D. and S. Butterfield, dry, T.D. 1,688 ft.
Knobs district: Kimmel et al 3 D. H. Davis, dry, T.D. 590 ft.

Ohio County

Hartford district: A. J. West et al 1 H. C. Acton, abandoned at 75 ft.

Hawkins Development Keeps Drilling Pace From Sagging

By R. MARNE SANFORD

DALLAS, Tex., Mar. 3.—General activity in the eastern Texas district is on the decline after several months of peak field activity and wildcatting set off by discovery of the Hawkins field late in 1940. The Hawkins field itself has been defined on almost all sides and the numerous wildcats throughout the nearby counties, started either as extreme outposts or as rank wildcats, have almost all resulted in failures. The Hawkins field work has settled down to Humble Oil & Refining Co.'s operations in the northern part of the field and to several pending tests for the townsite itself. On the whole, neither the size nor the productivity which was first expected has been borne out for the Hawkins field.

A survey revealed that at best the Hawkins field embraces little more than 2,500 proven acres. Although this figure is good for a new field still only some 3 months old, other facts discredit the field somewhat: The Woodbine sand is not particularly prolific, not as much so as in most other East Texas Woodbine sand fields. The crude is of extremely low gravity and brings below normal price. It has an insufficient gasoline content for lead-requirement rating. It has a 39.5 per cent of fuel-oil recovery on laboratory analysis, leaving only 18 per cent of straight-run gasoline, 12 per cent for kerosene, and 25 per cent for cracked gasoline and the remainder gas and loss.

The laboratory analysis figures are based on the 27-gravity oil of the townsite discovery and not the even lower 20 to 22-gravity oil found in subsequent townsite tests.

SUMMARY OF COMPLETIONS

East Texas Field

(1-hour gages)

	No.	Bbl.	Footage
Oil: Longview area	5	286	18,058
Kilgore area	9	385	32,100
Joiner area	1	60	3,636
Total	15	731	53,794

East Central Texas

Oil: Talco field	2	670	8,591
Hawkins field	1	400	4,804
Long Lake field	1	156	5,254
Gas: Opelika field	1	*250	8,300
Total	5	.....	26,949

*Million cu. ft.

Three Tests Are Coring

Nevertheless some work continues at the Hawkins field, Humble having three tests coring ahead in the Woodbine sand. Only one of these looks as though it will be a producing well. This is 1 Williams, B. H. Hampton Survey, 2 miles north of the town and in about the center of the structure near the northeastern edge of the proven area of the field. This test based the Austin chalk at 4,078 ft. It topped the Woodbine series at 4,223 ft. and found the gas-oil contact at 4,480 ft. It was coring below 4,580 ft. at the close of the week with a total depth of 100 ft. of saturation already drilled.

Not so favorable an outlook is seen for Humble's other two operations in the area. The 1 Dagnell, about 1½ miles south of the Manziel 1 Morrison, and in the northwest quarter of Parker Survey, at first believed to be situated on the extreme top of the entire structure, appeared to be a failure. This test based the Austin chalk at 4,053 ft. and topped the Woodbine series at 4,279 ft. It was coring below 4,497 ft. and believed to be in the Georgetown lime, the formation underlying the Woodbine sand. No saturation was reported at all in the Woodbine sand.

Also indicating failure is the 1 Bryan, ⅛ mile southwest of the 1 Dagnell, same survey. This test found only 25 ft. of Austin chalk from 4,135-60 ft. and topped the Woodbine sand at 4,215 ft. and is coring below 4,317 ft. with no shows yet reported.

Meanwhile, Humble was reported building a storage-tank battery on its Dagnell lease and was laying lines to the three tests to connect to the field's gathering system. This work started prior to the now-discouraging outlook for two of the three tests.

Chapel Hill Field Extended

The first major extension for the Pettit lime oil-producing level in the Chapel Hill field of Smith County was recorded the past week after official completion of Sun Oil 1 Warren, Stilwell Box Survey. It is the fifth oil producer for the field and extends the area about a mile to the west. Most of the wells in the area are large gas and distillate producers. Last gage on the well was 211 bbl. of oil in 21½ hours on a ¼-in. tubing choke. Production is through 155 casing perforations from 8,182-8,209 ft., total depth being 8,237 ft.

Still attempting to extend the Pettit oil level a mile to the northeast, Shell was swabbing at 1 Browning, John McDonald Survey, after the flow had died at the close of the week. The well had been completed earlier for 191 bbl. daily from 8,290-8,300 ft. after 4,000 gal. acid treatment. However, sustained flow could not be maintained.

EAST TEXAS FIELD COMPLETIONS

(One-hour gages)

Gregg County

Longview area: H. W. Donnell 1 Walker, 20 bbl., ¼-in. choke, 3,575-76 ft.
Roosth & Genecov 5-A Richey, 98 bbl. in 90 min., open tubing, 3,567-89 ft.
C. F. Smith 4 Jones, 80 bbl., open tubing, 3,538-75 ft.
Stanolind 14 Castleberry, dry at 3,630 ft.
Kilgore area: Delta Drlg. Co. 4 Alexander, 60 bbl. daily, pumping, 3,528-50 ft.
C. A. Everetts 5 Barton, 58 bbl., open tubing, 3,537-80 ft.
C. A. Everetts 6 Barton ,58 bbl., open tubing, 3,537-81 ft.
S. J. Felsenthal 2 Hughes & Ross, 40 bbl., open tubing, 3,526-38 ft.
Bess Johnson 4 Adams & Hale, 40 bbl., open tubing, 3,559-99 ft.
Nioco Oil 12 J. A. Knowles, 30 bbl., open tubing, 3,553-89 ft.
Potter Bros. 3 Gelber & Sons, 22 bbl., open tubing, 3,509-39 ft.
Shell 51 Elder, 44 bbl., open tubing, 3,539-54 ft.
John Wratheer 23-A I.&G.N. R.R., 33 bbl., open tubing, 3,539-70 ft.

Rusk County

Joiner area: British American 16 Stone, 60 bbl., open tubing, 3,627-36 ft.
Hall Walker 3 Moores, abandoned location.

Upshur County

Longview area: E. L. Ames 2 Lee & Jenkins, 65 bbl., open tubing, 3,630-58 ft.
E. L. Ames 3 Lee & Jenkins, 60 bbl., open tubing, 3,624-60 ft.

EAST CENTRAL TEXAS COMPLETIONS

Anderson County

Long Lake field: Tide Water-Seaboard 9 Monnig, 156 bbl., ⅛-in. choke, 5,176-5,254 ft.

Franklin County

Talco field: Humble 1 J. K. Rutherford, 45 bbl. in 3 hr., pumping, 4,290-4,303 ft.
Talco Asphalt Co. 8 Rutherford, 104 bbl. in 4 hr., flowing through open tubing, 4,265-88 ft.

Henderson County

Opelika field: Lone Star and Shamrock 1 Spradlin, top Goodland 6,308 ft., Paluxy 6,639 ft., Glen Rose 6,709 ft., first anhydrite 7,424 ft., second anhydrite 7,476 ft., base massive anhydrite 8,207 ft., pay 8,207-8,300 ft., 250,000,000 cu. ft. gas daily, open casing, 5,000 gal. acid.

Wood County

Hawkins field: E. B. Germany 1 Menchew, top Pecan Gap 2,965 ft., Austin chalk 4,048 ft., Woodbine sand 4,270 ft., oil sand 4,390 ft., total depth 4,804 ft., 330 bbl. in 18 hr., ¼-in. choke.

EASTERN TEXAS WILDCAT REPORT

Anderson County

Griffith Bros. 1 Clayton, William Frost Sur., Elkhart area, first report.
R. H. & W. Oil 1 Saunders, 17-acre tract in Joseph Ferguson Sur., in Frankston townsite, top sub-Clarksville 4,874-4,910 ft., fishing 5,225 ft.
Texas 1 Greenwood, M. Salisar Sur., 4 mi. NW Palestine, old hole junked at 2,150 ft., prepare set surface casing in new hole.

Lamar County

Whitehead & Dahl Bros. 1 J. M. Barr, P. Compton Sur., 9 mi. S Paris.

Leon County

H. A. Lindsay 1 J. L. White, McKinney & Williams Sur., 1 mi. SE of Buffalo, 10¾ in. at 1,021 ft., T.D. 2,025 ft.

McLennan County

E. P. Campbell 1 Stewart, S. Burton Sur., 5 mi. N of Waco, S.D. 765 ft.
Frank Place 1 Hackney, I. Robbins Sur., 4 mi. SE McGregor, T.D. 910 ft.

Navarro County

Hargrave Oil 1 C. S. West, M. Boren Sur., 1½ mi. S Richland, T.D. 3,257 ft., salt water.

Robertson County

C. C. Baker & Son 1 Middleton, J. S. McNeil Sur., 2 mi. S Elliott, S.D. 20 ft.
H. A. Clary 1 A. G. Scott, H. F. Thornton Sur., 2 mi. W Franklin.

Rusk County

Delta Drilling Co. 1 Kangera, 113-acre tract in R. Lane Sur., 3 mi. N of Henderson, 8,200-ft. test, drilling 2,000 ft.
Skelly Oil 1 Markey, Nolan Sur., 4 mi. SW Mount Enterprise, 8,000-ft. test, top Austin 3,352 ft., drilling 5,856 ft.
Beddinghouse 1 J. A. McCreary, H. Huejas Sur., 6 mi. SW Enterprise, rigginng up.

Upshur County

Sun Oil 1 W. C. Henderson, NW cor. of 27-acre tract in 100-acre tract in Robinson Asher Sur., just outside town of Ore City, 7,000-ft. test, top Nacatoch 1,815 ft., Pecan Gap 2,320 ft., Blossom 3,090 ft., Georgetown lime 3,784 ft., coring 4,987 ft.

Wood County

Travis & Stoddard 1 Bryan, C. M. Patton Sur., 1½ mi. W Hawkins, 467 ft. from N and E lines of survey, location.
Humble 1 Bryant, 467 ft. from N and W lines of W. Parker Sur., in Hawkins area, top Woodbine 4,215 ft., drilling 4,317 ft. with no shows.
Humble 1 Williams, 1,400 ft. from S and 467 ft. from W lines B. H. Hamilton Sur., in Hawkins area, top Woodbine 4,223 ft., saturation 4,480-4,580 ft., drilling ahead.
Humble 1 Clift, 106-acre tract in James Pollack Sur., in Hawkins area, derrick.
Jackson & McGlothlin 1 Moore, 10-acre tract in Joseph Knight Sur. in Crow townsite, Woodbine sand test, moving in material.
Ryan Consolidated Oil and W. C. McGlothlin 1 Gout, Wm. Clark Sur., near Crow, surface casing 1,150 ft.

La.-Ark. Fields

(Continued from Page 58)

288 bbl., 12/64-in. choke, T.P. 2,500 lb., C.P. 2,100 lb., 5½-in. casing 8,880 ft., perf. 8,864-68 ft. and 8,862-66 ft., Smackover lime, T.D. 8,882 ft.

Wildcat—Ouachita County

Berry Asphalt Co. 1 G. S. Martin. SW NE SW 17-14-19 T.D. 2,356 ft., salt water, dry, top Tokio 2,296 ft.

Smackover—Union County

Bob Milam 3 G. J. Childs . . SW SE NW 8-16-16 Pumped 65 bbl., 4 per cent b. s., T.D. 2,548 ft., 5½-in. casing 2,530 ft.

EAST TEXAS BORDER

Butler, King et al are reported to have oil sand at 2,525 ft., which may extend the Smithland oil field of Marion County. Reports cannot be reliably checked at this time.

EAST TEXAS BORDER COMPLETIONS

Wildcat—Bowie County

A. L. Willis et al 1 H. L. Taylor, John McGuire Sur., dry, T.D. 4,002 ft., top Paluxy 3,530 ft., salt water sands 3,602-37 and 3,738-70 ft.

Caddo—Marion County

Bain & Atchinson 1 E. F. Easterling, N. G. Nail Sur., dry, T.D. 1,673 ft., 6⅝-in. casing 1,410 ft.

Smithland—Marion County

Meyer Nathan 4 S. Hart, G. Coore Sur., 36 bbl., 5-in. casing 2,265 ft., T.D. 2,295 ft., oil sand 2,267-72 ft.

Wildcat—Marion County

H. T. Manning, Tr., 1 H. Howlett, L. Needham Sur., dry, T.D. 2,359 ft., 5-in. casing 2,311 ft.

EAST TEXAS BORDER DRILLING REPORT

Marion County

D. L. Butler et al 1 W. G. Bailey, Robert Maxwell Sur., drilling 2,269 ft., sand.
A. J. Vestal et al 1 C. Moseley, Daniel Lane Sur., S.D.
P. L. Withers et al 1 T. G. Allen, Robert Potter Sur., T.D. 2,366 ft., report show oil.

Sabine County

Sturm & Womack 1-A Keith, L. Grace Sur., S.D. 3,220 ft.

San Augustine County

B. F. Findley et al G. W. Allen, A. N. Davis Sur., S.D. 450 ft.
Roper & Todd 1 Long Bell, N. Hyden Sur., S.D. 781 ft.

Shelby County

Cougar Oil Co. 1 Jones, John Latham Sur., S.D. 2,509 ft.

Bradford Sand Is Prospective Gas Pay in S. W. Penna.

By STAFF CORRESPONDENT

PITTSBURGH, Pa., Mar. 3.—During the past week in the lower eastern fields, 16 operations were completed of which 3 were dry, 11 gas wells, and 2 oil producers.

SUMMARY OF COMPLETIONS

Southwest Pennsylvania

	No.	Bbl.	Footage
Gas wells	5	*0.3	15,245
Dry holes	1	.....	3,395
Total	6	.....	18,640
Recompletion	2	0.3	.....

West Virginia

Oil wells	2	4	3,864
Gas wells: Oriskany field	1	*4.6	5,335
Others	5	*2.6	8,991
Dry holes	2	.....	8,418
Total	10	.....	26,108

*Million cu. ft.

SOUTHWEST PENNSYLVANIA

Of interest to eastern gas companies is the possibility of a new producing horizon in Fayette County, Pennsylvania. Late last year the Nollem Oil & Gas Co. drilled a test on the Charles Lerch farm in Franklin Township, which was originally scheduled to test the Injun sand on the Fayette anticline. The location is northeast of Menallen Township, where considerable drilling has been done with more than fair results, although the pool was spotty. The test was dry in the Injun sand and drilling was continued. The Bradford sand was struck at 3,507 ft. with 19 ft. of sand and a gas volume of 150,000 cu. ft. with a rock pressure of 1,625 lb., indicating a long-lived well.

The next location on this structure was made 2,500 ft. northeast on the Priscilla Brocco farm. It was drilled through the Bradford horizon to 4,080 ft. The sand was dry and badly broken. At present, O. E. Eberly et al are drilling a test 750 ft. southwest of the Lerch well on the Clifton farm. It is now 1,626 ft. deep.

On Chestnut Ridge in South Union Township, Fayette County, Peoples Natural Gas Co. is drilling at 7,214 ft. in 3 Piedmont Coal Co. or 127 ft. below the top of the Oriskany sand. The gas volume is only about 26,000 cu. ft. and the sand is now somewhat limy. It does not appear that it will make a commercial well. Their No. 4 on this lease is drilling at 3,632 ft. and 9-in. casing was set at 3,492 ft.

Here, New Penn Development Co., William Snee et al have completed running casing to the top of the Onondaga chert, 6,395 ft., and cemented it. Work is just resuming and here the drilling will be watched with interest, as it is the the highest well on structure. These operators will move the casing crew to 1 Humberson on the Accident dome in Garrett County, Maryland, where the pipe will be run to below 6,000 ft.

The test of L. D. McMichael et al on the Elmer Pflug farm on Big Knob in New Sewickley Township, Beaver County, is shut down. The new cable to take it down to the Oriskany sand has been received.

Clarion County

Limestone Township: R. M. Burnham & Co. 2 Cyphert heirs, 54,000 cu. ft. gas, Thirty-foot sand, T.D. 2,443 ft.

Fayette County

Springhill Township: Johnson & Stephenson 1 Angelo Bruno, drilled deeper, 260,000 cu. ft. gas, Big Injun sand 1,397 ft., gas 1,529 ft., T.D. 1,587 ft.

Greene County

Dunkard Township: Donley & Lough 1 Littman heirs, drilled deeper, dry in deeper sands, Bayard sand 2,862-2,920 ft., show oil 2,882 ft., will save Big Injun sand 45,000 cu. ft. at 1,882 ft., T.D. 3,015 ft.

Indiana County

Brush Valley Township: T. W. Phillips 1 Leman Penrod, dry through Bradford sand, T.D. 3,395 ft.

Washington Township: T. W. Phillips 1 Al D. Fairman, 58,000 cu. ft. gas, Bradford sand, T.D. 3,413 ft.

Peoples 1 R. Bates, 12,000 cu. ft. gas, Tiona and Bradford sands, T.D. 3,862 ft.

Washington County

Hanover Township: G. W. Freshwater & Co. 4 Jesse Burns, 35,000 cu. ft. gas, Hundred-foot sand, T.D. 1,926 ft.

Westmoreland County

Lower Burrell Township: Peoples 1 John Hulton, 100,000 cu. ft. gas, Tiona and Sheffield sands, T.D. 3,601 ft.

WEST VIRGINIA

In Ravenswood district, Jackson County, after several successful Oriskany tests, more new work is listed, all as wildcats. The following tabulation is of new work:

McIntosh & Grimm 1 Charles M Winters, building rig.
McIntosh & Grimm 1 Austin Raines, location.
Everett Starcher et al 1 William H. Archer, material.
Joe Rubin et al 1 William H. Hunter, 50 ft.
Joe Rubin et al 1 H. O. Maddox, 1,175 ft.
Joe Rubin et al 1 James T. Curry, 60 ft.
Columbian Carbon Co. 1 J. E. Sweezy, building rig.
Boggess Drilling Co. 1 Mary Smith, fishing 1,150 ft.

In Harrison County the Hope Natural Gas Co. reached 9,871 ft. in the deep test on the C. S. Gribble farm in Grant district. Here the hard Medina formation have made slow going for the rotary tools.

Boone County

Peytona district: Owens, Libby-Owens 16 Bull Creek Coal Land Co., dry, through Newburg in the Lockport dolomite and through Clinton, highest gas test 63,000 cu. ft., will abandon, T.D. 5,818 ft.

Calhoun County

Lee district: O. R. Hardman and Rou Hildreth 1 D. R. Bush (L. G. Garrett 21 acres), 2 bbl., Injun sand, T.D. 2,108 ft.

Kanawha County

Elk district: A. E. Cavenler et al 1 Daniel Robertson heirs, 230,000 cu. ft. gas, Weir sand.

Lincoln County

Harts Creek district: Owens, Libby-Owens 23 Little Coal Land Co., dry, Berea, Big lime 1,900-2,090 ft., Big Injun 2,095-2,135 ft., Berea 2,569-95 ft., T.D. 2,600 ft., small show of gas in Berea only.

Pleasants County

Lafayette district: Sud Powell 1 J. S. Uminsetter, 2 bbl. in Big lime, drilled through Injun sand, T.D. 1,756 ft.

Maxton Oil & Gas Co. 2 First National Bank St. Marys, 100,000 cu. ft. gas in second Salt sand, through Injun sand, T.D. 1,936 ft.

Putnam County

Curry district: E. J. Elkins et al 1 John Hedrick, 60,000 cu. ft. gas after shot, Salt sand 990-1,120 ft., Big lime 1,496-1,667 ft., Big Injun 1,667-1,700 ft., Berea 2,218-35 ft., T.D. 2,261 ft.

Jackson Gas Co. 2 W. A. Rupe, 2,015,000 cu. ft. gas, Salt sand 1,070-1,470 ft., Big Injun 1,604 ft., gas 1,712-25 ft., T.D. 1,725 ft.

Ritchie County

Murphy district: Clem S. Morris 1 T. V. Cunningham, 150,000 cu. ft. gas, Injun sand, T.D. 1,969 ft.

ORISKANY GAS FIELDS

Kanawha County

Poca district: United Fuel 4895 Little Dawson, 4,574,000 cu. ft. gas before shot, Corniferous lime 5,205 ft., Oriskany 5,320 ft., T.D. 5,335 ft.

DRILLING

Poca district: Godfrey L. Cabot, Inc., 16 Putnam Co., Corniferous lime 5,008 ft., 7-in. casing 5,024 ft.

Godfrey L. Cabot, Inc., 6 J. L. McLean heirs, Corniferous lime 5,001 ft., 7-in. casing to 5,026 ft.

United Carbon Co. 1 Dock Haynes, Corniferous lime 4,829 ft.

United Carbon Co. 2 D. D. Slater, 8-in. casing to 2,062 ft.

Joe Rubin 1 E. M. Derrick, Corniferous lime 4,897 ft.

North Central Texas

(Continued from Page 64)

top Ordovician 5,380 ft., T.D. 5,577 ft., P.B. 5,380 ft., 55-qt. shot, hole bridged, cleaning out.

K. N. Davis 1 Jones, NW cor. E½ Sec. 2555, T.E.&L. Sur., 1 mi. SE Perrin, 2,500-ft. test, moving in rig.

Harper-McClintock 1 Kinder, 1,400 ft. from E and 467 ft. from N lines, Sec. 2667, T.E.&L. Sur., running 6⅝-in. casing 1,640 ft.

Continental 1 Johnson, N part of D. D. Burton Sur., Abst. 1671, 5,500-ft. test, drilling 4,721 ft.

C. H. Peterson 1 Hoefle, SE cor. John W. Barrett Sur., Abst. 48, 500-ft. test, 8-in. at 228 ft., 7-in. at 325 ft., show oil 340-42 ft., 438-44 ft., drilling 444 ft.

Adam Grafe 1 H. R. Bloodworth, 6,986 ft. from S and 3,244 ft. from N lines, William McDonald Sur., Abst. 380, 3,500-ft. test, first report.

Montague County

J. G. Hammond 1 Jester, 84-acre tract in E. Wingate Sur., Abst. 835, 2 mi. W of Mallard, top Caddo lime 6,282 ft., top Barnett 6,850 ft., T.D. 7,177 ft.

T. F. Hunter and Wilcox O. & G. 1 Barcas, SE Sec. 78, Kaufman C.S.L. Sur., Abst. 407, show oil 3,961-87 ft., 4,329-33 ft., 4,340-43 ft., 4,351-52 ft., conglomerate show oil 4,359-96 ft., drilling 4,480 ft.

Redman Brothers 1 Hardy, 225 ft. from N and E lines of 41-acre tract in Fielding Secrest Sur., Abst. 665, 2,500-ft. test, S.D. 1,360 ft.

Omohundro 1 Parr, 1,400 ft. from S and 467 ft. from W lines of 693-acre tract, G. Timmons Sur., Abst. 727, first report.

Benson & Benson 1 Seay, SE SE SE Sec. 31, Blk. 4, H.&T.C. Sur., 4,000-ft. test, first report.

Sinclair Prairie 1 Clingingsmith, 467 ft. from S and W lines of Sec. 149, Jose Olabarri Sur., Abst. 579, first report, 6,000-ft. test.

Tarrant County

Bruce Sullivan 1 W. C. Putnam, 200-acre tract in Milley Gilbert Sur., T.D. 7,836 ft., testing gas show 7,604-50 ft., preparing to abandon.

Throckmorton County

Humble 1 Allie McKnight, 1,100 ft. from N and 660 ft. from E lines, Sec. 2, D.L.&C. Sur., Abst. 1264, 5,000-ft. test, drilling 3,543 ft.

Humble 1 Durham, NW NW Sec. 1627, T.E.&L. Sur., top Caddo 4,182 ft., T.D. 4,428 ft., P.B. 4,241 ft., perf. 4,230-35 ft., treated 2,000 gal. acid, swabbed 8 hr. and returned 11 bbl. oil and 33 bbl. water, still testing.

Wichita County

King Oil 1 Ancell, 330 ft. from N and E lines of C. L. Gibbs Sur., Abst. 390, 4,000-ft. test, show oil, T.D. 3,837 ft., P.B. 3,680 ft., 250-qt. shot 3,621-80 ft., 2,000 ft. oil in hole, testing.

Underwood 1 E. D. Owens, SW SW Sec. 40, Specht & McCutchin subd., 1,250-ft. test, location.

Wilbarger County

W. H. Gant 1 Mock, Sec. 23, Blk. 11, H.&T.C. Sur., 6,000-ft. test, drilling 3,196 ft.

Omohundro 1 Jones, C Sec. 29, Blk. 16, H.&T.C. Sur., 5,500-ft. test, first report.

Young County

Ben H. Rankin 1 Mary Logan, SW part Blk. 2, J. W. Doty Sur., 8 mi. NE Graham, 2 mi. W Nelson field, tested 1,000,000 cu. ft. gas from 4,288-95 ft., top Marble Falls 4,470 ft., drilling 4,475 ft.

Hayden 1 Casey, 700 ft. from S and E lines, Sec. 1396, T.E.&L. Sur., 900-ft. test, S.D. 708 ft., repair.

E. L. Orr 1 Edwards, 1,170 ft. from N and 450 ft. from E lines, Sec. 1481, T.E.&L. Sur., 950-ft. test, top Gunsight lime 867 ft., show oil 899-908 ft., 7-in. at 898 ft., drilling plug.

H. R. Loftin 1 Loftin, SW cor. 80-acre tract in Ann Wood Sur., Abst. 1274, 600-ft. test, drilling 270 ft.

Frank Buttram 1 Holmes, 600 ft. from W and 1,960 ft. from S lines, J. M. McRodgers Sur., Abst. 1878, 4,000-ft. test, 7-in. at 4,006 ft., show gas 4,006-11 ft., drilling 4,060 ft.

L. T. Burns 1 Larimore A, 500 ft. from N and W lines of E 200 acres of Sec. 150, T.E.&L. Sur., 5,200-ft. test, first report.

Burns 1 Bailey, SE W¼ Sec. 60, T.E.&L. Sur., 7-in. 863 ft., show oil 863-68 ft., testing.

Mason & Hibbs 1 Leverman, SW SW Sec. 271 T.E.&L. Sur., drilling 685 ft.

P. N. Worthington 2 Rogers, NE cor. E 40 acres of S½ Sec. 219, T.E.&L. Sur., drilling 775 ft.

WEST CENTRAL TEXAS

FORT WORTH, Tex., Mar. 3.—New discoveries in Jones County's Akard and Stith areas, together with a new pay discovery in the Noodle Creek area also in Jones County, kept that part of West Central Texas in the foreground for another week.

Late in 1940 the Danciger Oil & Refineries, Inc., discovered a new Flippen sand field just 4 miles west of the Akard field in extreme southern Jones County. The discovery well was completed for 139 bbl. of 43-gravity oil in 16 hours from the Flippen sand drilled with saturation from 2,335-41 ft. This is the same pay as is producing in the nearby Akard field.

Danciger 2 Kelso in the Stith area encountered only slight shows of oil in the Flippen sand even though it was 6 ft. higher, structurally, and was therefore carried ahead. At 2,666 ft. saturation was encountered in the Swastika sand and drilled to a total depth of 2,669 ft. The 7-in. casing has been cemented at the top of the pay and in event of favorable weather plug will be drilled the first of the week. The well made 3 bailers of oil per hour but could not lower the oil level below 500 ft. The discovery well, 1 Kelso, is the only producer in the Stith field in the Flippen sand and 2 Kelso is the only well in the field to find oil in the Swastika sand. The company's 1 Gale, south of the original discovery well, is shut down after finding no oil shows in either the Flippen or the Swastika. This test is correlated 22 ft. lower, structurally, than 1 Kelso, the field discovery.

About 3 miles north and slightly west of the Stith area, Danciger is drilling below 1,000 ft. at 1 Foster, SW SW Section 13, Block 17, T.&P. Survey, an outpost test for the field.

Meanwhile approximately midway between the Stith and the Akard fields Harry Hines 1 Wimberly, south-

west corner of Godwin Subdivision 87, De Witt County School lands, is indicating production from the Cook level, slightly above the pays in either the Akard or the Stith fields. The wildcat topped saturation at 2,215 ft. and drilled to a total depth of 2,233 ft. The 7-in. casing has been cemented on top of the pay and unless better results than the 50 bbl. natural which was first estimated are obtained when plug is drilled, the section will be given a small acid treatment.

Also in Jones County and approximately 6 miles north of the Akard field another new discovery is in the finaling stages. It is Fain-McGaha Oil 1 Moore, T. Maltby Survey, just a mile southwest of the old six-pay Hawley field. The well found saturation in the upper Hope sand from 2,213 to 2,221 ft. and was estimated for 35 bbl. daily about 10 days ago. Subsequent testing has resulted in a considerable decline in flow, therefore operators are undecided as to whether to shoot the section or drill deeper and possibly later plug back and shoot. A producer of some magnitude is believed possible, which would class the well as a new discovery. Development is scheduled to continue in the area with the operators contemplating the immediate starting of a southwest offset to the discovery.

Overall Field Gets New Pay Level

The discovery of a new pay level in the Overall field of Coleman County to total six productive levels for the field was recorded at the Anzac Oil Corp. 1 Sealy Smith. The newest pay is the Cross Cut sand, which is found in other wells in the field but without saturation. The discovery is 2,060 ft. from the south and 2,600 ft. from the east lines of Section 13, Block 1, G.H.&H. Survey, and encountered the sand some 80 ft. higher, structurally, than other tests in the field. Saturation was drilled from 2,215-21 ft. after an estimated 1,500,000 cu. ft. of gas was found in the upper part of the section from 2,211 to 2,215 ft. Being estimated at about 100 bbl. daily, casing has been cemented at 2,215 ft. and plug will be drilled this week.

WEST CENTRAL TEXAS COMPLETIONS

(24-hour gages)

Jones County

Wildcat: Shaheen Oil 1 Young, dry at 2,261 ft., located 11,630 ft. from N and 300 ft. from E lines of S. Andrews Sur. 191.
Sayles field: F. K. Johnson and Ungren & Frazier 5 Sayles, Jr., 159 bbl. daily, 20-qt. shot, 1,941-53 ft.
Lewis Prod. 17 Sayles, Jr., abandoned location.
Lewis Prod. 18 Sayles, Jr., abandoned location.
Lewis field: Sandy Ridge Oil 5 Alton, 210 bbl. daily, ¼-in. choke, 2,013-25 ft.
C. W. and W. L. Snoddy 1 Curry, dry at 2,346 ft.

Callahan County

Wildcat: B. C. Mann 1 Windham, dry at 1,522 ft., located NW NE Sec. 154, Blk. 3, G.H.&H. Sur.

Coleman County

Dibrell field: M. R. Stuard 1 Minear, 4 bbl. daily, pumping, 1,102-09 ft.

Shackelford County

Ghio field: L. Baker 3-A Ghio, abandoned location.
Shackelford field: L. H. Choate 4 Dyer, dry at 1,260 ft.
Hendrick gas field: Kittery Oil 2 Hendrick, 2,500,000 cu. ft. gas daily, 1,601-21 ft.
Cook field: Roeser-Pendleton 2-A-118 Cook, 95 bbl. oil and 11 bbl. water, pumping, daily, 1,689-97 ft.

Taylor County

Wildcat: J. Bay Robertson and J. B. Dunigan 1 Creswell, dry at 3,877 ft., located SE SE SW G. Hancock Sur.
South View field: W. J. Walsh 1 Young, 109 bbl. daily, open tubing, 500 gal. acid, 2,376-84 ft.

WEST CENTRAL TEXAS WILDCAT REPORT

Brown County

A. J. Stokes 1 B. S. Bayston, 210 ft. from SE line and 2,962 ft. from SW line of Prosper Mangel Sur. 604, drilling 1,628 ft.
R. Richmond 1 Petros, SW SW Sec. 7, H.T.&B. Sur., 1,200-ft. test, S.D. 800 ft.
Manning, Richburg & Johnson 3 Charter, SE NW Sec. 19, Blk. 2, B.B.B.&C. Sur., 600-ft. test, first report.
J. O. Hart 1 Salie, 157-acre tract in Moses Little Sur., Sec. 10, 1,350-ft. test, first report.

Callahan County

W. D. Austin 1 I. N. Jackson, 150 ft. from N and W lines, Sec. 2, C.&M. Sur., show gas 832-42 ft., show oil 842-45 ft., H.F.W. 916 ft., T.D., cleaning out.
Reeves & Sorrell 1 Young, 1,980 ft. from N and 660 ft. from E lines, Sec. 37, B.B.B.&C. Sur., H.F.W. 1,975-2,000 ft., 6⅝-in. 2,000 ft., S.D.
Ungren & Frazier 1 Rushing, SE SE SE Sec. 116, B.B. B.&C. Sur., 1,500-ft. test, first report.

Coleman County

A. P. Heinze 1 J. Kincaid, 467 ft. from N and W lines of E½ SW Sec. 41, B.B.B.&C. Sur., 3,800-ft. test, 20-qt. shot 3,630-45 ft., T.D. show oil and water, cleaning out.
R. H. Murray 1 Morris, 467 ft. S and W of NE 160 acres of J. Greenwood Sur. 304, S.D. 1,305 ft., moving in spudder to start up.
Cooper Brothers 1 McClure, 1,100 ft. from S and 2,400 ft. from W lines of T. R. Frizzell Sur. 711, 2,800-ft. test, spudded and S.D.

Eastland County

Hickok Oil 1 Luse & Gray, NE Sec. 486, S.P. Sur., Ordovician test, ¾ mi. SE of new McElreath field, 4,250-ft. test, drilling up underreaming lugs at 2,720 ft.
A. A. Hutton 1 W. Penn, NW SE Sec. 11, Blk. 2, B.B. B.&C. Sur., 600-ft. test, S.D. 400 ft., correction.
Douglas Tomlinson, Jr., et al 1 Bennett, NE NE NE Sec. 6, Blk. 2, H.&T.C. Sur., 900-ft. test, show oil 890-96 ft., testing.

Erath County

W. A. Young 1 J. B. Mills, J. Harvey Sur., 5 mi. NW of Dublin, T.D. 212 ft., S.D.

Fisher County

F. A. Stephenson 1 Maberry, SE SW Sec. 56, Blk. 1, H.T.&B. Sur., 3,400-ft. test, cored 3,285-3,302 ft., recovered sand showing oil, top Swastika 3,277 ft., 40-gravity oil, deepened to 3,315 ft., 1,500 bbl. oil in storage, making est. 200 bbl. per day, T.D. 3,329 ft., P.B. 3,315 ft., testing.
General Crude Oil 12 Flanigan, center of old Royston field, top Ellenburger 6,094 ft., drilling 6,241 ft. and carrying 1,400 ft. sulfur water.
Landers & Eisele 1 Mose Newman, SE NW Sec. 8, Blk. 20, T.&P. Sur., 10-in. 301 ft., drilling 1,900 ft.
P. R. Long 1 Maberry, SE cor. A. A. Spring Sur., 2 mi. SW of McCaully, coring 3,003 ft.

Hamilton County

A. J. Caldwell 1 W. W. Jones, 1,002 ft. from NE, 150 ft. from SE lines, W. H. Crowder Sur., correction, S.D. 2,999 ft.
Falls Ref. Co. (formerly Wallace & Vickers) 2 Lund, C S½ of 20 acres of N½ of SW¼ R. J. Bailey Sur. 51, top Ellenburger 3,853 ft., S.D. 3,953 ft.
Groover & Rose 1 Joe Fuqua, 1,600 ft. from W and 640 ft. from S lines of J. W. Bowers Sur., 3,000-ft. test, first report.

Jones County

H. Hines and W. D. Brookover 1 A. N. Wimberly, SW SW Subd. 91, De Witt C.S.L. Sur., 2,500-ft. test, saturation 2,215-33 ft., 7-in. 2,215 ft., est. 50 bbl. daily.
Fain-McGaha Oil 1 Moore, 660 ft. from NE and 1,320 ft. from SE of S 107 acres of J. D. Maltby Sur. 252, 2,500-ft. test, saturation 2,215-21 ft., preparing to complete on pump, est. 25 bbl. oil per day, naturally, flow declined from 35 bbl. oil per day to 10 bbl. oil per day, may drill deeper or shoot section.
Danciger Oil & Ref. 1 Jacob Foster, SE¼ W 100 acres, SW¼ Sec. 13, Blk. 13, T.&P. Sur., 3,000-ft. test, 15½-in. 133 ft., drilling 194 ft.
J. C. Hunter 1 Minter, N½ Lot 7, Sec. 192, Robert Smith Sur., 2,400-ft. test, 12-in. 61 ft., drilling 665 ft.
Fain-McGaha 1 Cooper, SE SE SW Sec. 29, Blk. 15, T.&P. Sur., 4,000-ft. test, first report.
W. W. Fondren 1 C. P. Rogers, 126-acre tract in N¼ Sec. 32, Blk. 18, T.&P. Sur., 3,100-ft. test, first report.

McCulloch County

W. J. Willard 1 E. B. Garrett, 467 ft. from N and E lines of Sur. 934, Abst. 1196, 3,000-ft. test, S.D. 550 ft.
Clark 1 Lively, SE cor. Sec. 931, H. F. Hetzfeldt Sur., 650-ft. test, S.D. 820 ft.

Palo Pinto County

Wilcox O. & G. 1 Rogers, 467 ft. from E line, Sec. 894,

MICHIGAN OPERATIONS

Bay County Deep Test Ready To Resume Drilling

By OTTO C. PRESSPRICH

SAGINAW, Mich., Mar. 3.—Small producers and dry holes were the rule in Michigan oil fields last week as 15 tests were completed. Seven of the completions were oil wells with combined daily initial production of a little over 400 bbl. Three of these are in the Ottawa County section, two—smallest of the seven—in Van Buren County, other in Arenac and Allegan. The eight tests completed as dry holes were scattered through six counties.

After the previous week's spurt, new development was featureless and the prospects of an American Drilling Co. test in Oceana County, on the state's western edge, while dimmed by water encroachment, remained undetermined, the hole not yet having been drilled in.

Prospects brightened for an early resumption of drilling on the state's deepest oil test, Gulf Refining Co. 1 Bateson in Monitor, Bay County. With most of the drill pipe recovered from the 7,776-ft. hole, preparations were under way to put heavy equipment in action to drill the test to 9,000 ft. An explosion and gas fire late last year checked progress on the test.

Meanwhile, Bay Pipe Line Co. was completing a 4-in. line from the Monitor field to its main line connecting the Buckeye-Wise field to the refinery at Bay City. Three additional tests are drilling in the Monitor-Kawkawlin townships area, most advanced being a wildcat 3 miles north of present production, in Kawkawlin, now below 2,000 ft.

Wildcat failure.—Featured among the dry holes was the first failure for Pure Oil Co. on its Narmore lease in Porter, Midland County. Orders were issued to abandon the No. 39 after water was encountered at 3,420 ft. The lease is believed to be the biggest producing property in the state. United Drilling & Producing Co. Consumers test in Summerfield Township, Clare County, quenched hopes for a new field there. Activity was light in most of the established fields and development in the numerous wildcat tests was generally without feature.

New drilling.—Oakland County appeared for the first time this year in the weekly list of drilling permits approved by the state Conservation Department. The 14 permits, bringing the total for the year to 125, were for locations in 10 counties, two each in Allegan Ottawa, Isabella, and Van Buren, one each for Clare, Roscommon, Kent, Montcalm, Monroe, and Oakland.

Chances for more exploration was to be made available March 7, date set by the Conservation Department for auction of oil and gas leases on 32,000 acres of state-owned lands, all listed as wildcat except for about 200 acres in Bentley, Gladwin County. The sale offers lands in the following counties: Arenac, Clare, Crawford, Gladwin, Iosco, Missaukee, Oceana, Ogemaw, Osceola, and Roscommon.

SUMMARY OF COMPLETIONS

	No.	Bbl.	Footage
Oil wells: Allegan County	1	125	1,574
Arenac County	1	100	2,952
Ottawa County	3	150	5,411
Van Buren County	2	30	2,108
Dry holes: Allegan County	1	.....	1,620
Midland County	2	.....	4,933
Montcalm County	1	.....	1,344
Muskegon County	1	.....	1,878
Ottawa County	2	.....	3,817
Van Buren County	1	.....	1,281
Total	15	.....	26,918

MICHIGAN COMPLETIONS

Allegan County

Overisel Township: Regal Dutch Petroleum 1 Vanderhoop, NW SW SW 12-4n-14w, dry, T.D. 1,620 ft.
Salem Township: Socony-Vacuum 1 Green, SE NE NW 14-4n-13w, 125 bbl., acid, T.D. 1,574 ft.

Arenac County

Adams Township: Don Rayburn 2 Milne, SE SW SE 23-19n-3e, 100 bbl., acid, T.D. 2,952 ft.

Midland County

Edenville Township: Sun 2 Consumers Power, S½ SW SE 9-16n-1w, dry, T.D. 1,513 ft.
Porter Township: Pure 29 Narmore, N½ SW NE 15-16n-1w, dry, T.D. 3,420 ft.

Montcalm County

Belvidere Township: Belvidere 1 Shaffer, C NE 25-12n-7w, dry, T.D. 1,344 ft.

Muskegon County

Dalton Township: R. C. Lentz, Tr., 1 Eklund, SE NE SE 25-11n-16w, dry, T.D. 1,878 ft.

Ottawa County

Georgetown Township: Fisher-McCall 2 Mackus, SW NE NW 2-6n-13w, 25 bbl., acid, T.D. 1,794 ft.
Tallmadge Township: Gordon 3 Connell, SE NE SE 24-7n-13w, dry, T.D. 1,984 ft.
Smith Petroleum 2 Kilpatrick, SE NE SE Sec. 34, dry, T.D. 1,833 ft.
Smith Petroleum 2 Visser, SW SW NW Sec. 34, 25 bbl., acid, T.D. 1,797 ft.
Edward B. Strom 1 Zawadski, SE SW NW Sec. 34, 100 bbl., acid, T.D. 1,820 ft.

Van Buren County

Bangor Township: J. McLean 1 McConnohie, SW SE NW 21-2s-16w, 20 bbl., acid, T.D. 1,006 ft.
Bloomingdale Township: Clapsaddle & Harris 2 Schock SE NE NW 15-1s-14w, dry, T.D. 1,281 ft.
Geneva Township: A. R. Urion 1 Tripp, NE NE NE 4-1s-16w, 10 bbl., acid, T.D. 1,102 ft.

T.E.&L. Sur., T.D. 3,300 ft., P.B. 1,505 ft., made 3 bailers water and 1½ bailers oil, S.I.

Hickok Prod. and Reynolds 1 J. R. Halsell, 467 ft from S and W lines, Sec. 92, B.B.B.&C. Sur., Abst. 105, 5,500-ft. test, show gas 1,545-65 ft., drilling 1,595 ft.

Shackelford County

B. & F. Cotton Warehouse 1 Snyder, NE SW NE Sec. 32, L.A.L. Sur., 800-ft. test, first report.

J. F. Baker and M. E. Daniels 1 Davis, SE NW Sec. 3, Blk. 13, T.&P. Sur., 1,700-ft. test, first report.

E. M. Doloach 1 Cook, SE SE NE Sec. 64, E.T. Sur., location.

Georgian Oil 2 Blach, 1,290 ft. from SE and 540 ft. from SW lines, Sec. 391, T.E.&L. Sur., spudded and S.D.

Grossenbacher & Hagerty 1 Elliott, SW SW Sec. 12, L.A.L. Sur., 8¼-in. 570 ft., S.D. 608 ft.

Taylor County

Ce-Beth Oil 1 City of Abilene, south shore of Lake Abilene on city property, 4,000-ft. test, T.D. 2,480 ft., top lime 2,443 ft., show oil 2,453-78 ft., rigging up to drill deeper.

California Fields

(Continued from Page 74)

ing Co. has recompleted 11 Hartman flowing 700 bbl. of relatively clean 28.9-gravity oil and 240,000 cu. ft. of gas per day through a 30/64-in. bean after deepening the hole from 8,719 ft. to 9,111 ft. Tubing pressure is 125 lb. and casing pressure is 275 lb.

COASTAL DISTRICT COMPLETIONS

Padre Canyon Field

General Pet. Corp. 4 Padre 15-3n-24w
Pumped 160 bbl., 21.7-gravity, 20 per cent cut. Elev. 415 ft. T.D. 5,300 ft., P.B. 5,270 ft. 6⅝-in. water string cemented 4,975 ft. 532 ft. 4¾-in. liner landed 5,266 ft. and cemented through perf. 4,986 ft. Perf. open to production 4,984-5,266 ft. 100 days' drilling time. Large cut indicates possibility bottom plug defective. Ventura County.

Rincon Field

C. C. M. O. Co. 40-B Hobson 16-3n-24w
Pumped 65 bbl., 30.1-gravity, 6 per cent cut. Elev. 678 ft. T.D. 5,503 ft. 7-in. water string cemented 5,325 ft. 681 ft. 4¾-in. liner landed 5,502 ft. Perf. open to production 4,821-4,986 ft., 5,072-5,160 ft., 5,313-5,499 ft. 4,690 ft. 2½-in. tubing. Completed in Hobson zone. 44 days' drilling time. Ventura County.

San Miguelito Field

Continental 21 Grubb 24-3n-24w
Flowed 444 bbl., 28.4-gravity, 3 per cent cut, 2,919,000 cu. ft. gas. 1¼-in. and ¾-in. beans. Pressures 170/300 lb. Elev. 855 ft. T.D. 6,884 ft. 7-in. water string cemented 5,459 ft. 1,501 ft. 4¾-in. liner landed 6,883 ft. Perf. open to production at various intervals. 6,621 ft. 2-in. and 2½-in. tubing. 40 days' drilling time. Ventura County.

Santa Maria Valley Field

Union 3-1 Moretti 14-10n-35w
Flowed 1,304 bbl., 16-gravity, 1 per cent cut. 22/64-in. bean. Casing pressure 375 lb. Elev. 110 ft. T.D. 5,275 ft. 5-in. combination string landed 5,275 ft. and cemented through perf. 4,942 ft. Perf. open to production 4,952-5,275 ft. 20 days' drilling time. Santa Barbara County.

Shiells Canyon Field

Texas Co. 140 Shiells 4-3n-19w
Pumped 65 bbl., 36.6-gravity, 1.5 per cent cut. Elev. 1,148 ft. T.D. 4,100 ft. 7-in. water string cemented 3,372 ft. 774 ft. 5-in. blank liner cemented 4,097 ft. 4,026 ft. 2½-in. tubing. Gun perforated 4,035-80 ft. with 70 shots. Found only 4 holes open and reperforated with 90 shots. Completed in Shiells zone. 134 days' drilling time. Ventura County.

COASTAL DISTRICT WILDCATS

Castaic District

Morse-Mangold 1 McDermott 26-5n-17w
Location. Los Angeles County.

Del Valle District

R. E. Havenstrite 1 Vasquez 21-4n-17w
Drilling 4,092 ft. in sandy shale. Los Angeles County.

Huasna District

Harvey Oil Corp. 1 Huasna 11-32s-14e
T.D. 4,520 ft. Pump water with trace of oil. Cleaning out. 7-in. casing cemented 3,520 ft. 997 ft. 5½-in. liner including perf. at intervals 3,416-4,462 ft. 4,450 ft. 2½-in. tubing. Formation tests: 3,924-4,129 ft. showed small amount of oil; 3,360-3,420 ft. recovered 1 bbl. mud, no oil; 3,535-3,715 ft. recovered 950 ft. gas-cut mud and trace of oil; 3,712-3,881 ft., good blow, recovered 1,800 ft. gassy oily mud, 900 lb. bottom-hole pressure; 3,880-4,100 ft. recovered 1,000 ft. gassy mud; 4,135-60 ft. recovered 50 ft. oily gassy mud. Heavy oil show on ditch at 875 ft. San Luis Obispo County.

MISSISSIPPI AND SOUTHEAST

Tinsley Extended Southeast By Woodruff Sand Test

By GEORGE WEBER

JACKSON, Miss., Mar. 3.—Four points of interest evolved from last week's developments in Mississippi. Another southeast extension to Tinsley resulted from the finding of good Woodruff section, although the edge test ran low. Sharkey County will be watched in the next few weeks, as a second wildcat begins, offsetting a test believed to have commercial possibilities, but abandoned because of mechanical failure. The third point is Warren County, where one test is coring the Wilcox section and a second is rigging up to explore the same horizon. Another test is an interesting Attala County wildcat attracting attention this week end.

SUMMARY OF COMPLETIONS

	No.	Bbl.	Footage
Oil wells	1	202	5,915

Tinsley developments.—P. J. Ruman (General Oil Co.) 1 Robertson, a southeast edge test in 29-10-2, gave further stimulus to the southeast play by showing a good section of Woodruff oil sand, although the test ran low on the Selma chalk formation. Outcome of the test was doubtful but the oil section proves still further the extensive development to the southeast, and will result in further location and drilling of outpost and edge tests in that sector of the field.

On the west side, Union Producing Co. is swabbing 1-A Woodruff, which, although offsetting a 73-ft. Woodruff sand well on the west, missed the Woodruff, and is a probable Perry sand producer.

Wildcats

British American Oil Producing Co. is rigging up 1-A Houston, in 23-11n-7w, Sharkey County, which offsets No. 1, abandoned in February at 4,027 ft. with a fishing job. The first test showed oil in the Selma chalk, topped at 3,280 ft., but a lost section of drill stem prevented proper testing, or drilling to the contract depth of 5,000 ft.

In Warren County two operations are of interest. W. O. Allen successfully sidetracked the old hole above the Wilcox formation at 2,626 ft. and began coring at 2,898 ft. At latest report, a depth of 3,415 ft. had been reached, with no oil shows reported. On Davis Island, Waggoner Brothers Oil Co. 1 Parker is rigging up. This will be a 7,000-ft. test which will core 600 ft. of Wilcox section. The interest in the Wilcox in this western Mississippi county is prompted by success in finding oil and gas about 600 ft. below the top of the formation in La Salle Parish, Louisiana, about 65 miles to the southwest.

Another production test in the Attala County wildcat, Jones & Crosby 1 Allen is under way. Operators 2 weeks ago perforated casing at 4,018½-21 ft. and recovered salt water. The section at 4,018-25 ft. showed production possibilities on an electrical log, and operators have squeezed perforation points and are shooting higher in an attempt to miss the salt-water section.

General Developments

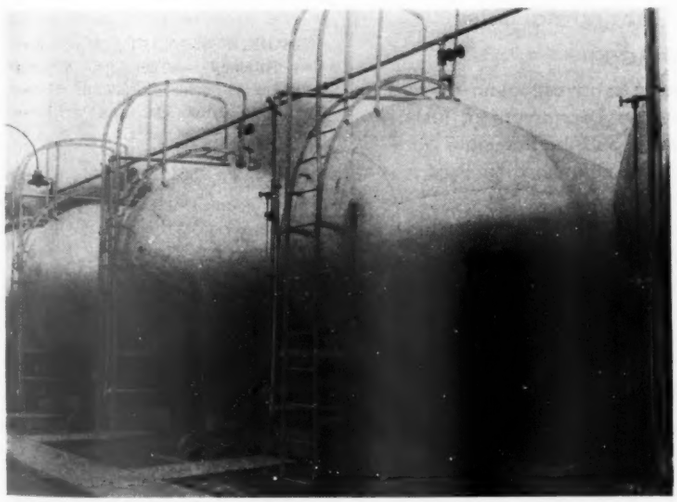
Leasing continues about the same in Claiborne, Hinds, Perry, Issequena, Stone, Yazoo and Copiah counties. A Perry County wildcat to be drilled by F. E. Courson may be started in April. Geophysical activity continues to decline, with 18 crews in South Mississippi and 9 in South Alabama last week. Core drilling is in operation in Copiah County.

The Pickens field, Yazoo County, passed its 333,000-bbl. mark last week as production showed the first levelingoff since the daily average began declining in mid-January. The field consists of four wells operated by Sinclair Wyoming Oil Co., known to March 1 as Exchange Oil Co. One well is inactive at present, and all are making salt water and are pumping. It is unlikely that any further drilling will ever be done at Pickens.

Refining in Mississippi advanced another step last week as work began on foundations for the Paluxy Asphalt Co. plant at Crupps, near Tinsley, and Mid-South Refining Co. acquired a 94-acre tract in Jackson for the refinery which

(Continued on Page 91)

PART OF BEAIRD'S JOB AT THE NEW WARREN PLANT AT SALEM, ILL.



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Personal Paragraphs

W. B. SINCLAIR, geologic scout with Amerada Petroleum Corp., has moved from the company's Jackson, Miss., office to Tyler, Tex. He is succeeded in Jackson by JAMES F. MICHAELS, who transfers from Illinois.

MAURICE McKENZIE and SHELDON ARMSTRONG, of Rixford, Pa., have purchased 103 acres containing 32 producing wells at Simpson, McKean County, Pennsylvania, from GALE P. OAKES, LEROY OAKES, CLYDE OAKES and others interested in the P. A. Oakes Producing Co., of Mount Jewett.

H. DOUGLAS BROWN, JR., assistant superintendent of the Brundred Oil Corp., Oil City, Pa., and RALPH BLAUSER, an employe of the company, succeeded in roping a deer and dragging it ashore from the ice-filled Allegany River above Oil City. The deer, a large buck, in crossing the ice, fell on a smooth piece and was unable to rise. The two men fastened ropes about themselves and worked their way across the river.

FRANK R. DENTON, formerly East Texas district geologist for Stanolind Oil & Gas Co., and R. M. TROWBRIDGE, formerly East Texas district stratigrapher for Shell Oil Co., have resigned their positions and entered into a general consulting partnership with headquarters in Tyler, Tex.

JACOB E. ROBERTS, 74, field superintendent for DAVID B. McCALMONT, Venango County, Pennsylvania, producer, was honored at a gathering at the home of Mr. McCalmont at Franklin, Pa., on March 3, marking his 50 years of service with that concern. He was first employed by the late S. P. McCalmont, father of D. B. McCalmont.

HARRY F. SINCLAIR, chairman of the executive committee of Consolidated Oil Corp., headed a group of executives and directors of the parent company and Venezuela Petroleum Co., departing last week for Venezuela. Venezuela Petroleum recently discovered a new field in the State of Monagas. Future development will be planned by the group while on the inspection trip.

ALBERT P. GROEBL, Big Spring, Tex., has been elected a director of Cosden Petroleum Co.

J. A. MILLER has been appointed advertising and sales-promotion manager of Standard Oil Co. of New Jersey. He succeeds James A. Donan, who died recently. Mr. Miller joined the company's advertising department in 1934.

VAUGHN C. MALEY, district geologist for the Humble Oil & Refining Co., at Hattiesburg, Miss., has been transferred to Midland, Tex., as division geologist in the West Texas district. Mr. Maley replaces J. BEN CARSEY, who has been transferred to Lake Charles as division geologist in the Louisiana division. E. A. MURCHISON, geologist in the Houston office, is being transferred to Hattiesburg to succeed Mr. Maley.

EDWIN W. PAULEY, president of the Petrol Corp., independent producer, marketer and refiner, has been appointed personal representative of Chairman Edward J. Flynn of the Democratic National Committee for the six western states, and his sphere of influence in California, Oregon, Washington, Arizona, and New Mexico will be to promote party harmony and assist in liquidating the present indebtedness.

GAGE LUND, Houston, Tex., formerly assistant manager of the California Co. and Standard Oil Co. of Texas, has been elected president and a member of the board of directors of the California Co. Other officers and directors elected are H. D. COLLIER, San Francisco, Calif., chairman of the board; H. F. DAVIES and J. H. PAYNE, Denver, Colo., vice presidents; H. C. TEASDEL, San Francisco, secretary and treasurer, and C. V. PORTER, Baton Rouge, director.

R. A. ESTES heads an exploratory crew recently moved to Snyder, Tex., by Humble Oil & Refining Co., to work in Scurry County.

RAYMOND C. BECKER, geologist, Union Producing Co., Houston, Tex., has been transferred to the company's home office in Shreveport, La.

J. I. STALEY, Wichita Falls, Tex., independent operator, is recuperating at his home from bruises and lacerations suffered in an automobile accident 10 days ago near Jacksboro, Tex.

BURT MARTIN, chief gaging and tank-strapping engineer, Stanolind Pipe Line Co., Tulsa, spoke before the Seminole, Okla., A.P.I. chapter February 27 on "Basic Principles of Oil Purchasing."

COL. MARTIN E. COLLIS, who heads the tabulating department, United Gas Pipe Line Co., Shreveport, La., has been called to active duty in the U. S. Army and is now in Washington.

J. D. ROBINSON, superintendent of Union Oil Co. for San Joaquin division, has assumed direction of production activities of the company in the coastal district in addition to his other duties. H. A. BRETT, heretofore superintendent of production in the coastal district, has been transferred to Los Angeles Basin.

Do You Remember?

From The Oil and Gas Journal Files

25 YEARS AGO

The Federal Trade Commission is investigating oil and gasoline prices and production; the Department of Justice also is investigating gasoline prices and the Interstate Commerce Commission is investigating pipe lines in Pennsylvania.

Standard Oil purchasers are buying distillate from independent refineries and it is rumored that it is being cracked.

Oil is being shipped to Germany in increasing quantities from Galicia. The capture of these oil fields was a timely act and of great advantage to the Teutons.

20 YEARS AGO

New work is starting in the Burbank district of Osage County which promises to be one of the best pools opened in 1920.

There are now 4 producers and 58 drilling wells in the new Huntington Beach field. Meanwhile, there is no letup in the older fields.

10 YEARS AGO

Construction of the 300-mile pipe line from the Hugoton field to serve Colorado Springs and other towns will be commenced shortly.

During the year just passed, 21 refineries installed cracking equipment to bring the total cracking capacity to 1,828,959 bbl.

FRANK CAMPBELL, general superintendent, Lago Oil & Transport Co., Aruba, sailed last week for South America on the Grace Line's Santa Rosa.

GEORGE T. NAFF, Shreveport, La., attorney has accepted appointment as general counsel of United Gas Pipe Line Co. and affiliated companies, Shreveport.

CYRUS S. GENTRY, secretary and general counsel of the Shell Oil Co., Inc., for territory east of the Rocky Mountains, has been made a member of the American Petroleum Industries Committee.

V. A. WALSTON, civil engineer in the East Texas division for the Humble Oil & Refining Co., has been transferred to the West Texas division at Midland, Tex., as assistant division civil engineer.

JAMES A. DUNN, vice president of Barnsdall Oil Co. with offices in New York, arrived in Los Angeles this week and will spend several days on the West Coast before returning to his office.

A. I. LEVORSEN, Tulsa, president of the American Association of Petroleum Geologists in 1936, now chairman of the A.A.P.G. research committee, delivered an address last week before the Midland Geological Society at Midland, Tex.

HUBERT BALE, consulting geologist of Oklahoma City, Okla., addressed the Ardmore Geological Society March 5 on "Valuation of Oil Properties."

J. W. JORDAN, assistant to W. L. CONNELLY, chairman of the board of Sinclair Prairie Oil Co., and F. H. RHEES, petroleum engineer, Tulsa, were in Bairoil, Wyo., last week inspecting company operations.

RALPH TALLEY, head of the land department for Magnolia Petroleum Co., Dallas, Tex., was the principal speaker at a meeting of the Magnolia Young Men's Club in the Y.M.C.A. at Dallas this week.

JOHN REDMAN, petroleum engineer, Shell Oil Co., Inc., has been transferred from the Tulsa office to the field office at Pampa, Tex., where he expects to remain for approximately a year.

R. F. SCHERMERHORN, independent producer of West Texas, has moved his offices from Big Spring, Tex., to the Continental Building in Dallas, Tex. He is president of the Schermerhorn Oil Corp.

WARREN WEEKS, geologist for the Phillips Petroleum Co., Shreveport, La., discussed "The Geology of the Schuler field, Arkansas, and Its Relationship to the General Area" at the weekly meeting of the Houston Geological Society the past week.

JOSEPH MURPHY, head of the materials, terminal and warehouse department of the Standard Oil Co. of Venezuela, will return to South America next week. While in this country he visited his uncle, J. J. CONRY, Tulsa, president of Carter Oil Co.

Chief Humble Geologist

Morgan J. Davis, newly elected chief geologist for Humble Oil & Refining Co., Houston, Tex., was born in Anson, Tex., in 1898. He received his education in Fort Worth, Tex., and had been in Texas Christian University only a year and a half when he entered the Army. Upon being discharged following the Armistice, he entered the University of Texas, where he spent 2 years. Early in 1921 he accepted a position as engineer on the Spavinaw water project for the city of Tulsa, upon the completion of which project he returned to the university, graduating in 1925.

MORGAN J. DAVIS

He joined Humble in June 1925, and 4 years later was transferred to one of the foreign operations of the Standard Oil Co. of New Jersey. After 5 years' service with the Netherlands subsidiary of Standard of New Jersey, during which he served chiefly in Java and Sumatra, Netherlands East Indies, Mr. Davis returned to the Humble organization in January 1934. He served as division geologist of the southeastern New Mexico division until September 1936, when he was transferred to the Gulf Coast division, in Houston. His promotion to the position of chief geologist came February 7, 1941.

Mr. Davis is married, and he and Mrs. Davis, whom he married in 1926, have two young sons.

M. E. ROBERTS, division geologist for Pure Oil Co. in West Texas, has been transferred to the company's Fort Worth, Tex., office.

G. W. GREENLEE, scout for Mid-Continent Petroleum Corp., Jackson, Miss., will be transferred to Tyler, Tex., in mid-March.

R. W. SANDERS, and Mrs. Sanders, Calgary, Alta., Canada, have left for Trinidad, British West Indies, where Mr. Sanders will be connected with the oil industry.

TOM COOK, independent oil and gas operator, Amarillo, Tex., is in the hospital in that city, recuperating from a heart ailment. His condition is reported improving.

THOMAS A. O'DONNELL, pioneer California oil man and first president of the American Petroleum Institute, is recuperating at his Palm Springs, Calif., home.

J. SAYLES LEACH, executive vice president of the Texas Co., Houston, Tex., was reelected president of the Houston Community Chest and Council, at the annual meeting of the organization last week.

J. HOWARD PEW, president, Sun Oil Co., Philadelphia, Pa., has been appointed chairman of the A.P.I. central committee on tanker and barge transportation. R. C. TUTTLE, Atlantic Refining Co., is vice chairman.

J. H. HOOPER, Houston, Tex., has been transferred to Midland, Tex., by Phillips Petroleum Co. to become West Texas and New Mexico scout replacing OVERTON BLACK whose resignation from the scouting department became effective March 1.

W. L. VALENTINE, president of Fullerton Oil Co., was reelected a member of the board of directors of the Automobile Club of Southern California at the annual election recently held in Los Angeles. BYRON C. HANNA and GURNEY E. NEWLIN, who represent Standard and Union Oil companies at various times, are members of the nominating committee.

Shifts: JOHN E. McKITTRICK, engineer, Tex Harvey Oil Co., from Arroyo Grande, Calif., to Dallas, Tex.; V. A. KNIGHT, manager, Barnsdall Oil Co., from Mankins, Tex., to Odessa, Tex.; W. R. KENNEDY, engineer, Texas Co., from Penwell, Tex., to Wichita Falls, Tex.; H. A. KING, vice president, Sinclair Prairie Oil Co., from Houston, Tex., to Austin, Tex.; G. T. BRIGGS, superintendent, Texas Co., from Shreveport, La., to New Orleans, La.; T. O. WINN, land and lease department, Texas Co., from Shreveport, La., to New Orleans, La.; JAMES A. DAVIS, vice president, Empire Southern Gas Co., from Alexandria, La., to Fort Worth, Tex.; R. F. CRUMLEY, JR., geologist, Phillips Petroleum Co., from Houma, La., to Lake Charles, La.; HOMER C. MOORE, geologist, Texas Co., from Vandalia, Ill., to Oakley, Kans.; W. L. MORRIS, geologist, Gulf Research & Development Corp., from Durant, Miss., to Cotulla, Tex.; RALPH H. GRANT, president, Grant & Hawkins, from South Haven, Mich., to Houston, Tex.; VIC E. BAUM, superintendent, Ryan Consolidated Petroleum Corp., from Winfield, Kans., to Dallas, Tex.; H. C. DAVIS, JR., engineer, Caracas Petroleum, S.A., from Caracas, Venezuela, to Austin, Tex.; J. O. RUNDLE, superintendent, Loffland Brothers, from Jennings, La., to Gueydan, La.

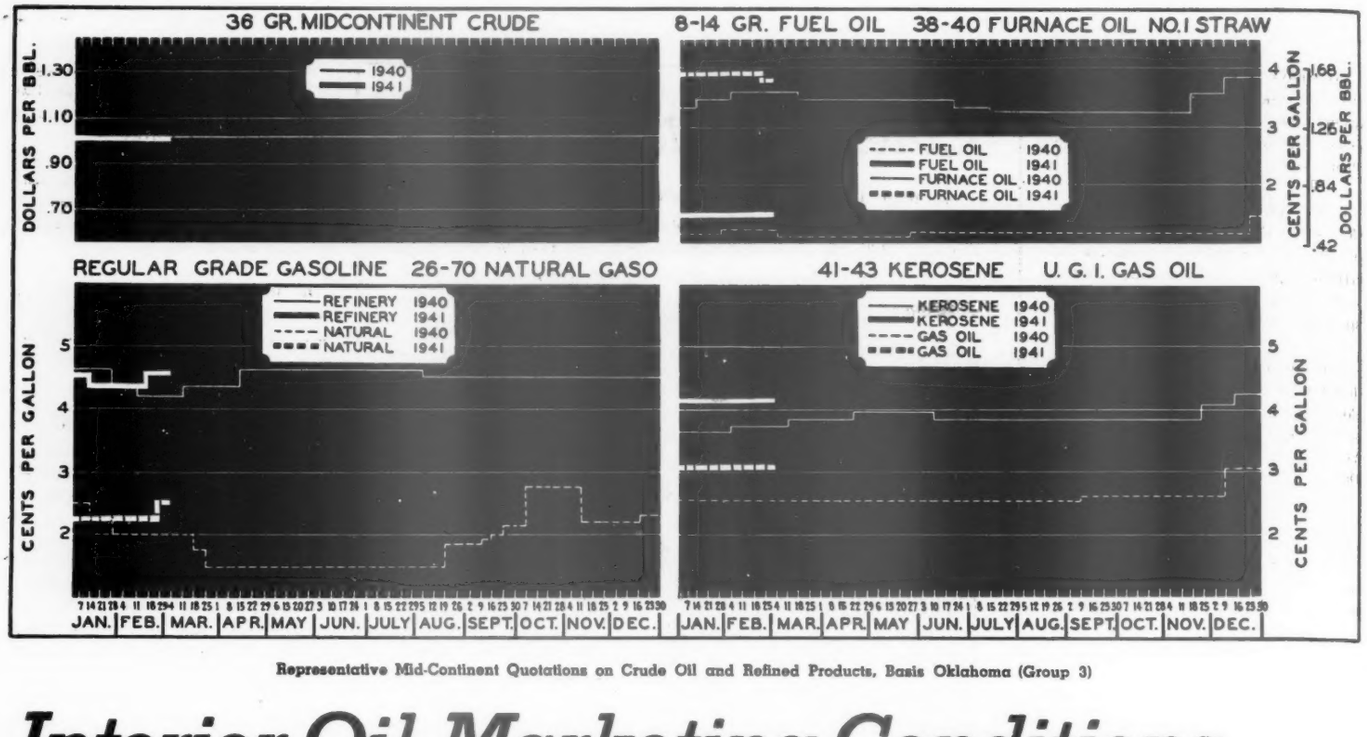
GEONISIO CARVALHO BARROZO and LUIS CHAVES, Brazilian geologists, have started their studies in the petroleum-engineering department, University of California, at Berkeley. Their studies in this country for a year have been arranged through a scholarship made available by J. E. BRANTLY, president of the Drilling & Exploration Co., which is conducting exploratory operations for the Brazilian Government at Bahia and Maceio, Brazil.

J. F. NAGLE, executive assistant for the Skelly Oil Co. in Tulsa, is rejoining its marketing department and will reside and have his office at Kansas City, Mo., effective March 6. ROBERT F. PIELSTICKER of the company's crude-oil purchasing department at Wichita, Kans., has been appointed executive assistant. He will assume at Tulsa the duties heretofore performed by Mr. Nagle and will continue to handle crude-oil purchases from offices at Tulsa and Wichita.

B. B. GREGORY, district chief clerk in the Navarro Crossing district for Humble Oil & Refining Co., has been transferred to the Hawkins district. VIRGIL O. HARRIS, district petroleum engineer in the Gladewater district, has been transferred to Hawkins. A. W. COMPTON, district chief clerk in the London district, was also transferred to Hawkins.

DR. EDWIN H. WENBERG and DR. A. A. FITCH have been added to the aerogeology department of Seismograph Service Corp., Tulsa. Dr. Wenberg comes to the company from the University of Iowa, where he has recently acquired his doctor's degree. Dr. Fitch is a graduate of the London School of Mines, London, England, and has had world-wide experience in the interpretation of aerial photography.

HAROLD J. DUNCAN, supervisor of the northwest district of the U.S.G.S., has left Casper, Wyo., for Washington, D. C., where he will relieve J. R. REEVE, supervisor of the Mid-Continent district, as acting chief of the oil and gas leasing division of the U.S.G.S. Supervisors of the various districts have been taking turns in acting in place of the chief of the division, H. B. SOYSTER, who is in California on extended business for the department.



Representative Mid-Continent Quotations on Crude Oil and Refined Products, Basis Oklahoma (Group 3)

Interior Oil-Marketing Conditions Presage Early Gasoline Advance

By H. STANLEY NORMAN

ADVANCE of the interior refinery-gasoline market before March ends is presaged by the volume of business and general aspects of the Mid-Continent situation. Several close observers of market trends are speculating that the advance will come by middle of the month. More conservative elements think the forward movement will be delayed until later in March but there are not many dissenting opinions from the consensus that an advance is imminent.

Strength of the refinery motor-fuel market is transfused to natural gasoline where advances of ⅛ to ¼ of a cent per gallon developed this week. Production of natural gasoline in Texas that exerted a retarding influence on the general Group 3 market is currently in approximate balance with demand. Relief of the natural-gasoline-market pressure from Texas plants has accorded Oklahoma and Kansas material a chance to seek its own level. Consequently, plant operators in the northern part of the producing territory have elevated quotations in keeping with urgent demand that has existed for several weeks.

Sales of 26-lb. natural in Oklahoma were reported this week at 2½ and 2⅝ cents per gallon. Top of the market is ¼ cent higher than prevailed earlier.

Strong Stock Position

Mid-Continent refiners are in a relatively strong gasoline position. Stocks are slightly lower in Oklahoma, Kansas, and Missouri than a year ago. Demand from jobbers in the Middle West is running above the average rate of increase for the entire country. The temporary setback in motor-fuel demand expected by some to result from the late February storms in the northern states has not materialized. Failure of weather conditions to depress refinery-gasoline demand is joined with business psychology of northern jobbers. Purchases for spring consumption were deferred by many customers anticipating that a decision on the Petroleum Rail Shippers Association case might reduce the delivered cost of products. There is still no assurance when the Interstate Commerce Commission will act. Early development of the spring motoring season makes it undesirable for distributors to longer delay accumulation of supplies.

Intimate relationship of petroleum markets east of the Rocky Mountains is made more realistic by recent events. This affinity is shown by the promptness with which Mid-Continent gasoline conditions stiffened when the Gulf Coast became more active. Revival of coastal business permitt d southern movement of products originating in intermediate localities and at the same time released the pressure they had long exerted on Group 3 markets.

Recycle-plant condensate is not currently a serious competitive factor in the motor-fuel tank-car market. Refiners are taking increasing quantities of condensate into their processing operations under conditions advantageous to recycle plants. Any slight disadvantage in field prices for condensate is offset by assurance of an uninterrupted market. Then too, warm weather offers problems in the use and handling of volatile condensate that give refinery gasoline a distinct advantage.

Fuel Contrastingly Soft

Improvement in the market outlook for gasoline is offset to some extent by further losses this week in distillate fuel oil. Shipping instructions from northern buyers have tapered off sharply and the price structure has softened in sympathy with the curtailment of business. Softness of the fuel-oil market applies only to the light grades for home heating. Residual fuels are stronger than ever with supplies in the Mid-Continent falling considerably below demand.

Lubricating oils are moving at a higher level. Demand is particularly strong for high-viscosity cylinder stocks for consumption in heavy industrial machinery. Solvent-refined oils are also strong but the Mid-Continent supply of these lubricants is limited, for all practical purposes, to requirements of contract customers. Reports continue to reach the Mid-Continent that Pennsylvania lubricating-oil prices are inching higher and that a general lift in quotations there is impending. There is agreement that any additional increase in Pennsylvania lube prices will permit Mid-Continent markets to advance.

Refined Oil Market Barometer

Extension of refinery gasoline-price advances on the Gulf Coast has buoyed the entire market structure east of the Rocky Mountains. Observers predict that advances at inland refining centers and terminals along the eastern seaboard soon will follow. Distillate fuel-oil prices are turning soft in nearly all sections of the country.

MID-CONTINENT: Natural-gasoline prices are ⅛ to ¼ cent higher.

GULF COAST: Offerings of No. 2 fuel at 2⅞ cents reported.

CALIFORNIA: Gasoline moving on routine market. Fuels strong.

PENNSYLVANIA: Wax prices higher. Gasoline and neutral supplies tight.

CHICAGO: Scope of gasoline demand presages record consuming season.

Decline of Heating-Oil Prices Extended Along East Coast

By J. P. O'DONNELL

NEW YORK, Mar. 4.—The declining East Coast heating oil market receded another step last week when several of the major suppliers reduced their quotations on No. 2 fuel oil to 4 cents in the New York Harbor area, a decline of 0.3 cent from previously quoted levels. This makes the total decline in this price since the first of the year 0.9 cent per gallon and since this approximates the reduction in coastwise transportation rates during a slightly longer period, the opinion is voiced that the latest decline will at least temporarily halt the downward trend in light-heating-oil quotations.

Since 50 per cent of the large East Coast market is supplied directly from the Gulf Coast in season, the remainder being accounted for by East Coast production, imports and withdrawals from storage, the reduced transportation rates were bound to affect the market strongly. Coastwise tanker rates have dropped 40 cents per barrel from the season's high, equivalent to approximately 1 cent per gallon.

The declines in heating-oil prices are attributed entirely to the coastwise tanker-rate decline since demand for light fuel oil in the East Coast district has been of record proportions this season. Preliminary estimates place demand for gas oil and distillate fuel oil on the East Coast for the first 3 months of the season at 26,700,000 bbl. against 22,125,000 bbl. for the corresponding period of the previous season. This is an increase of more than 4,500,000 bbl. or fully 20 per cent.

A comparison of East Coast demand for the first 3 months of the 1940-41 season and that of the same period of the 1939-40 season, showing sources of supply, is given in the accompanying table.

	1940-41 (bbl.)	1939-40 (bbl.)
Production	10,015,000	8,679,000
Receipts (Gulf)	13,085,000	10,729,000
Receipts (California)	257,000	319,000
Imports	940,000	.....
Total	24,297,000	19,727,000
Out of stocks	2,654,000	2,713,000
Total demand	26,951,000	22,440,000

While inventory reductions during the first 3 months of the season, October, November and December, may be regarded as unsatisfactory due to the high inventory level at the opening of the season, those of recent weeks have been extremely satisfactory and indications are that the end of the 6-month period of peak heating-oil consumption will find stocks pretty much in line with preseason hopes. Since the week ended January 4, gas-oil and distillate-fuel stock reductions on the East Coast have averaged about 100,000 bbl. per day and withdrawals on the Gulf Coast have been even more marked proportionately.

Total stocks of gas oil and distillate fuel oil in the East and Gulf Coast refining districts on January 4 were 24,240,000 bbl. and this total had been reduced to 18,249,000 bbl. on February 22, a decline of 6,000,000 bbl., approximately 25 per cent. If withdrawals are maintained at this rate during the remainder of the season, stocks on March 31 will be down to 14,000,000 bbl. for these districts against 11,250,000 bbl. on that date a year ago. In view of the fact that the excess over last year at the beginning of the current season was approximately 11,000,000 bbl. and in view of the large increase in demand, indicated stocks on March 31 this year should not in themselves constitute an adverse market factor.

Last week's reductions in heating-oil prices had been anticipated for at least 10 days due to continued reports of price concessions of as much as 0.25 cent per gallon in tank-car sales. Concessions of this magnitude were rumored in North New Jersey a week earlier and last week were reported general. This is an important consuming center and the effect of lower prices there was soon felt elsewhere.

The decline in tank-car quotations which went into effect in the latter part of the week was heralded 2 days earlier by reductions in tank-wagon prices of fuel oil at many New England and upstate New York points. This reduction amounted to 0.10 cent but later in the week a further reduction of 0.3 cent was made effective at Boston, Portland, Providence and Hartford.

Coincident with the reduction in heating-oil prices, kerosene prices were also lowered by a number of suppliers. Prices affecting all methods of delivery in much of the New York-New England area were reduced 0.2 cent in midweek. Later in the week 0.2-cent reductions were put into effect at the principal consuming centers mentioned above.

Both tank-car and barge prices of kerosene were reduced in the New York Harbor area by some of the major suppliers. In each instance the reduction amounted to 0.3 cent, bringing the New York Harbor minimum tank-car price for kerosene down to 4.6 cents per gallon though other major suppliers continue to quote 4.9 cents. The kerosene reductions were attributed to the same cause as the continued decline in No. 2 fuel-oil prices, the lower coastwise transportation charges.

Diesel oil was also quoted lower by some suppliers in the New York Harbor area. A 10-cent reduction brought the minimum posted price in the New York Harbor area down to $1.65 per barrel against a season's high of $1.95. A similar

(Continued on Page 91)

Gulf Coast Gasoline Price Gain Extended

HOUSTON, Tex., Mar. 4.—Additional strengthening of Gulf Coast refinery-gasoline markets placed quotations at least a cent above low levels of 3 weeks ago. All grades of material were tighter with refiners holding out against bids at lower figures.

Bottom quotations on 80-research gasoline were 4⅞ cents with the majority of suppliers asking 5 cents. Leaded 72-74-octane gasoline was held at a minimum of 4½ cents with 70-72-octane unleaded material at approximately the same figure. Quotations on 68-70 unleaded gasoline were boosted to a minimum of 4¼ cents. Low-octane gasolines ranging down to 65 octane were particularly tight with practically none available from any source. Four cents was considered absolute bottom.

No important spot sales were reported made at any of the higher quotations. From a trading standpoint the week was considered rather quiet, which caused market observers to question the basis for the strengthening, especially in view of the reported increases in gasoline stocks. However, there was no questioning the fact that no material was available except at refiners' advanced quotations and at these prices offerings were scarce.

Gas oils were weaker with little prospect of improvement. Material is freely available at 3 cents. Buyers reported having offers at 2⅞ cents. There is no new business coming in,

(Continued on Page 91)

A.P.I. Weekly Refinery Statistics

Week Ended March 1, 1941

	Capacity reporting (per cent)	Total gasoline stocks (bbl.)	Residual fuel-oil stocks (bbl.)	Gas oil and distillate stocks (bbl.)	Daily crude runs (bbl.)
East Coast	100.0	20,383,000	8,536,000	11,905,000	558,000
Appalachian	91.0	3,219,000	486,000	418,000	121,000
Ind., Ill., and Ky.	90.2	18,907,000	3,125,000	2,857,000	600,000
Okla., Kans., and Mo.	76.9	8,731,000	1,946,000	1,185,000	293,000
Inland Texas	59.6	2,296,000	1,460,000	375,000	119,000
Texas Gulf	89.2	14,544,000	6,939,000	4,957,000	865,000
Louisiana Gulf	97.6	3,357,000	1,974,000	915,000	138,000
N. Louisiana and Ark.	51.5	577,000	538,000	290,000	47,000
Rocky Mountains	56.0	1,605,000	443,000	164,000	36,000
California	87.3	16,368,000	71,520,000	10,084,000	466,000
Total reported	86.2	89,987,000	96,967,000	33,150,000	3,243,000
Est. unreported	.....	6,930,000	1,680,000	575,000	342,000
*Est. total	.....	†96,917,000	98,647,000	33,725,000	3,585,000
*Est. total previous wk.	.....	95,812,000	98,631,000	34,381,000	3,590,000
*March 2, 1940	.....	99,437,000	103,181,000	24,590,000	3,445,000

*Bureau of Mines. †Includes 6,348,000 bbl. aviation gasoline, up 81,000 bbl.

Stocks of Crude Oil in the United States

(BUREAU OF MINES ESTIMATE)

Week ended February 22, 1941	261,783,000 barrels
Week ended February 15, 1941	260,948,000 barrels
Week ended February 17, 1940	240,836,000 barrels

Figures do not include stocks of heavy, unrefinable California crude.

RETAIL OIL MARKETS...

Tank-wagon and filling-station prices on gasoline and kerosene furnished by larger marketing firms

Prices as of March 4, 1941

Taxes

The gasoline quotations given in the following tables include the 1½-cent federal tax, as well as state, county, and city taxes. The gasoline is the regular or standard grade. In most areas lower grades and a premium grade also are available.

Standard Oil Co. (Indiana)

	Gasoline Tank wag.	Dir.	Incl. tax	Kero. tank wag.
Chicago, Ill.	14.6	12.6	4.5	10.0
Decatur	14.6	13.1	4.5	9.5
Joliet	15.6	14.1	4.5	10.0
Peoria	15.6	13.2	4.5	10.0
Quincy	15.4	13.9	4.5	9.8
Davenport, Ia.	15.6	14.1	4.5	‡10.0
Des Moines	15.4	13.9	4.5	‡9.8
Mason City	15.8	14.3	4.5	‡10.2
Duluth, Minn.	16.4	14.9	4.5	10.8
Mankato	16.0	14.5	4.5	9.5
Minneapolis	16.0	14.2	4.5	10.4
LaCrosse, Wis.	17.0	15.5	5.5	10.4
Green Bay	17.4	15.9	5.5	10.8
Milwaukee	16.8	15.3	5.5	10.2
Detroit, Mich.	14.1	12.6	4.5	8.1
Grand Rapids	14.3	12.8	4.5	9.1
Saginaw	14.9	13.4	4.5	9.1
Evansville, Ind.	16.6	15.1	5.5	†9.8
Indianapolis	16.8	14.8	5.5	†10.0
South Bend	16.8	15.3	5.5	†10.0
Fargo, N. D.	18.2	16.7	5.5	11.6
Huron, S. D.	17.5	16.0	5.5	10.9
Kans. City, Mo.*	14.9	11.9	4.5	8.6
St. Louis*	14.7	13.2	4.5	9.6
St. Joseph	14.9	13.0	4.5	8.4
Wichita, Kans.	13.8	12.3	4.5	7.2

*State tax 2 cents, 1-cent city tax, and 1½-cent federal tax. †Does not include 4-cent state tax. ‡Does not include 3-cent state tax.

Exclusive of state general sales taxes.

Discounts to commercial consumers. On purchases per month off tank-wagon prices: 1,000 gal. or more, 1.5 cents off, minimum delivery 25 gal.

Stanolex Fuel Oil in Chicago

Effective Dec. 2, 1940, f.o.b. Chicago, tank-wagon prices: Standard heater oil, 1-99 gal., 9.0 cents; 100-149 gal., 8.0 cents; 150 gal. and over, 7.5 cents. Stanolex fuel oil No. 1, 1-99 gal., 8.5 cents; 100-399 gal., 7.5 cents; 400 gal. and over, 7.0 cents. Stanolex furnace oil, 1-99 gal., 8.5 cents; 100-399 gal., 7.5 cents; 400 gal. and over, 7.0 cents. Stanolex fuel oil A, 1-399 gal., 6.0 cents; 400-790 gal. 5.0 cents; 800 gal. and over, 4.75 cents. Stanolex fuel oil B, 1-399 gal., 6.0 cents; 400-799 gal., 5.0 cents; 800 gal. and over, 4.75 cents. Stanolex Bunker C fuel oil, 1-999 gal., 4.75 cents; 1,000 gal. and over, 3.75 cents.

Ohio

STANDARD OIL CO. OF OHIO

	Gasoline Cons'r tank wag.	Divided dir.	Incl. tax	Kero. tank wag.
Ohio points	16.0	15.0	5.5	*9.0

*Includes state tax of 1 cent.

Atlantic Coast District

STANDARD OIL CO. OF NEW JERSEY

	Gasoline Cons'r tank car	Dir. tank wag.	Incl. tax	Kero. tank wag.
Atlantic City	11.00	12.60	4.5	7.5
Newark	11.00	12.60	4.5	7.5
Annapolis, Md.	12.85	14.35	5.5	9.5
Baltimore	12.25	13.75	5.5	8.4
Cumberland	13.65	15.15	5.5	10.0
Washington, D.C.	10.50	12.00	3.5	9.5
Danville, Va.	14.45	16.95	6.5	9.0
Norfolk	13.25	15.75	6.5	10.5
Petersburg	13.55	16.05	6.5	11.2
Richmond	13.55	16.05	6.5	11.0
Roanoke	14.75	17.25	6.5	10.0
Charles'n, W. Va.	14.05	16.55	6.5	11.5
Parkersburg	13.35	15.85	6.5	11.2
Wheeling	14.35	16.85	6.5	11.8
Charlotte, N. C.	16.40	16.50	7.5	9.8
Hickory	16.95	18.45	7.5	9.7
Mt. Airy	16.80	16.00	7.5	10.6
Raleigh	16.15	17.00	7.5	9.9
Salisbury	16.45	15.50	7.5	10.3
Charleston, S. C.	14.25	16.75	7.5	9.25
Columbia	15.10	17.60	7.5	(*)
Spartanburg	15.80	18.30	7.5	12.2

Price basis to Essolene undivided dealers: Dealer tank-wagon price less 0.5 cent per gallon. Price basis to commercial consumers, effective March 8, 1937, in Maryland, District of Columbia, and in Arlington and Fairfax counties in Virginia and March 12 in New Jersey: To contract accounts purchasing at least one full compartment at a time by hose connection, on yearly purchases: From 2,500 to 100,000 gal., consumer tank-wagon price at time and place of delivery: 100,000 gal. per year, consumer tank-car price plus 0.5 cent per gallon. Consumer tank-wagon price generally will be equivalent to dealer tank-wagon price less 0.5 cent per gallon.

Effective January 16, 1939, in North Carolina the commercial consumer schedule became as follows: Single deliveries of 50 gal. or more, consumer tank-wagon price. Single deliveries of less than 50 gal., 4 cents per gallon over consumer tank-wagon price. Generally the posted consumer tank-wagon price will be equivalent to the dealer price, less 0.5 cent per gallon. The above policy also applies in South Carolina, effective January 23, 1939.

*Kerosene business of the company at these points now exclusively handled by dealers.

Southern District

STANDARD OIL CO. (KENTUCKY)

	Gasoline Cons'r tank wag.	Net dlr.	Incl. tax	Kero. tank wag.
Atlanta, Ga.	15.0	15.0	7.5	9.0
Augusta	16.5	16.5	7.5	9.5
Macon	16.0	16.0	7.5	9.0
Savannah	15.5	15.5	7.5	9.0
Birmingham, Ala.	16.5	16.5	8.5	8.0
Mobile	15.5	15.5	9.5	8.0
Montgomery	18.0	18.0	9.5	10.0
Jackson, Miss.	14.0	14.0	7.5	9.0
Vicksburg	15.5	15.5	7.5	8.5
Jacksonville, Fla.	16.0	16.0	8.5	8.0
Miami	16.0	16.0	8.5	8.0
Pensacola	17.0	17.0	9.5	8.0
Tampa	16.0	16.0	8.5	8.0
Lexington, Ky.	15.5	15.5	6.5	9.0
Covington	13.5	13.5	6.5	8.0
Louisville	15.0	15.0	6.5	8.5
Paducah	12.5	12.5	6.5	8.5

Price basis to tank-wagon consumers, effective January 4, 1937, 3 cents per gallon below tank-wagon price.

Montgomery, Ala., has a county tax of 1 cent per gallon, and a city tax of 1 cent per gallon on gasoline, in addition to state tax, and 1 cent per gallon on kerosene. Mobile, Ala., has a city gasoline tax of 2 cents per gallon: Birmingham, Ala., has a city gasoline tax of 1 cent per gallon; Pensacola, Fla., has a city gasoline tax of 1 cent. All are included in the table.

Pennsylvania and Delaware

ATLANTIC REFINING CO.

	Gasoline Cons'r tank car	Dir. tank wag.	Incl. tax	Kero. tank wag.
Philadelphia, Pa.	12.5	13.5	5.5	9.5
Pittsburgh	13.0	15.0	5.5	10.5
Allentown	13.0	14.5	5.5	10.5
Erie	12.5	15.0	5.5	10.0
Scranton	13.0	14.5	5.5	10.5
Altoona	13.0	15.0	5.5	10.5
Dover, Del.	...	14.0	5.5	10.5
Wilmington	...	13.5	5.5	10.0

Price basis to undivided dealers, dealer tank-wagon price less 0.5 cent per gallon.

Discount on kerosene, 2 cents per gallon off tank-wagon price on tank-wagon deliveries of 25 gal. or more at one time.

Pacific Coast Territory

STANDARD OIL CO. OF CALIFORNIA

	Gasoline Tank truck	Serv. sta.	Incl. tax	Kero. tank wag.
San Francisco	16.5	17.5	4.5	11.5
Los Angeles	16.0	17.0	4.5	10.0
Fresno, Calif.	17.5	18.5	4.5	12.5
Phoenix, Ariz.	20.5	21.5	6.5	*17.5
Reno, Nev.	19.5	20.5	5.5	13.5
Portland, Ore.	19.0	20.0	6.5	13.5
Seattle, Wash.	19.0	20.0	6.5	13.5
Spokane	20.5	21.5	6.5	16.5
Tacoma	19.0	20.0	6.5	13.5

*Includes 5-cent state tax.

Discount to dealers: On gasoline, off tank-wagon price, to 100 per cent dealers, 3 cents. To commercial consumers: On tank-wagon price; on single deliveries of 40 gal. and over, advance quantity discount extended at time of delivery, 3 cents. Service-station schedule applies on single deliveries less than 40 gal. On kerosene in tank-car, transport-truck, and trailer delivery, 3 cents off tank-wagon price; plant deliveries to jobbers, 2.5 cents below tank wagon.

March 18, 1939, split dealer discount was canceled.

New York and New England

SOCONY-VACUUM OIL CO., INC.

	Gasoline Cons'r tank car	Dir.* tank wag.	Incl. tax	Kero. tank wag.
Albany	12.7	12.0	5.5	7.4
Met. New York	12.5	12.7	5.5	7.3
Buffalo	13.0	13.5	5.5	8.0
Rochester	13.2	13.7	5.5	8.7
Syracuse	12.5	10.7	5.5	8.6
Portland, Me.	12.2	12.7	5.5	7.6
Manchester, N. H.	13.4	12.8	5.5	8.5
Burlington, Vt.	11.8	12.0	5.5	7.9
Boston, Mass.	10.9	11.4	4.5	7.6
Worcester	11.5	11.5	4.5	7.6
Hartford, Conn.	11.3	11.5	4.5	6.8
New Haven	11.1	11.3	4.5	7.2
Providence, R. I.	10.9	11.9	4.5	7.8

*Undivided.

Effective August 8, 1940, the company changed its commercial consumer policy in New York and New England to the following:

Full compartment deliveries: Accounts buying less than 20,000 gal. annually, 0.5 cent above the commercial-consumer price; accounts buying from 20,000 to 120,000 gal. annually, commercial-consumer price; accounts buying 120,000 gal. annually and above, 0.25 cent off consumer price. Split compartment deliveries: Delivery of less than a full compartment, 250 gal., commercial-consumer price plus 1 cent. Steel-barrel deliveries: Commercial price plus 3 cents.

Rocky Mountain District

CONTINENTAL OIL CO.

	Gasoline Tank wag.	Incl. tax	Kero. tank wag.
Denver, Colo.	14.5	5.5	10.5
Grand Junction	16.5	5.5	12.0
Pueblo	15.5	5.5	9.0
Casper, Wyo.	16.5	5.5	11.5
Cheyenne	12.0	5.5	11.0
Billings, Mont.	16.5	6.5	12.0
Butte	15.5	6.5	13.0
Great Falls	15.5	6.5	12.0
Helena	15.5	6.5	12.5
Salt Lake, Utah	16.0	5.5	14.0
Boise, Idaho	†18.6	6.5	16.0
Twin Falls	†19.6	6.5	16.5
Albuquerque, N. M.	*16.0	7.0	9.5
Roswell	*14.0	7.0	8.0
Santa Fe	‡17.0	7.5	9.5

*Includes city tax of 0.5 cent. †Includes toll-bridge tax of 1 mill. ‡Includes city tax of 1 cent.

Tank wagon represents price to consumers. Dealer represents price to dealers. If no dealer price is quoted, the tank-wagon price applies to all classes of trade.

Central South District

STANDARD OIL CO. OF LOUISIANA

	Gasoline Cons'r tank car	Dir. tank wag.	Incl. tax	Kero. tank wag.
New Orleans, La.	14.25	16.75	8.5	‡10.0
Baton Rouge	14.75	17.25	8.5	‡10.5
Alexandria	14.75	17.25	8.5	‡10.5
Lafayette	15.00	17.50	8.5	‡10.0
Lake Charles	14.75	17.25	8.5	‡10.0
Shreveport	14.00	16.50	8.5	10.0
Knoxville, Tenn.	18.00	20.00	8.5	12.5
Memphis	16.00	18.00	8.5	11.0
Chattanooga	17.50	17.35	8.5	12.0
Nashville	17.00	17.50	8.5	10.0
Bristol	18.25	18.75	8.5	11.0

Essolene at dealer price less 0.5 cent per gallon to undivided dealers.

‡Includes 1-cent state tax.

Price basis to commercial consumers: Effective May 15, 1937, deliveries of 50 gal. or more in one territory take posted consumer tank-wagon price. Accounts taking deliveries of less than 50 gal. at one time pay posted consumer tank-wagon price plus 4 cents per gallon. Generally, the posted consumer tank-wagon price will be equivalent to the dealer price less 0.5 cent per gallon. Kerosene prices include 1-cent state tax.

Effective February 24, 1939, the company reestablished in New Orleans the commercial consumer policy on motor fuel effective in the rest of the state.

Effective December 12, 1938, the company revised its commercial consumer policy on motor fuel in New Orleans, as follows: Single deliveries of less than 50 gal., consumer tank car plus 2 cents per gallon 50 to 199 gal., consumer tank car plus 1 cent per gallon; 200 gal. and over, consumer tank car plus 0.5 cent per gallon.

Oklahoma and Arkansas

CONTINENTAL OIL CO.

	Gasoline Tank wag.	Incl. tax	Kero. tank wag.
Texarkana, Ark.	13.5	5.5	6.0
Fort Smith	13.5	5.5	6.5
Little Rock	16.0	8.0	8.0
Muskogee, Okla.	13.5	5.5	7.0
Oklahoma City	11.5	5.5	6.5
Tulsa	12.5	5.5	6.0

Tank wagon represents price to consumers. If no dealer price is quoted, the tank-wagon price applies to all classes of trade.

Nebraska

STANDARD OIL CO. OF NEBRASKA

	Gasoline Tank wag.	Dir.	Incl. tax	Kero. tank wag.
Omaha	17.4	15.9	6.5	9.8
McCook	17.0	14.4	6.5	9.5
Norfolk	17.5	15.9	6.5	9.9
North Platte	17.8	16.0	6.5	10.2
Scottsbluff	17.4	15.0	6.5	10.8

Discounts to commercial consumers for tank-wagon deliveries covered only by standard commercial consumers contract, effective January 1, 1935.

Texas

	Gasoline Tank wag.	Dir.	Incl. tax	Kero. tank wag.
Dallas, Tex.	11.5	15.5	5.5	6.0
Fort Worth	11.5	15.5	5.5	7.0
Houston	12.0	16.0	5.5	8.0
San Antonio	12.5	17.0	5.5	8.0

Naphtha

STANDARD OIL CO. (INDIANA)

	Tank wagon*
Oleum spirits	16.2
V.M.&P. naphtha	16.5
Cleaners' naphtha	15.5
Stanisol	15.5

*Prices include 3-cent Illinois tax but not 1-cent federal tax nor 2 per cent retail occupational tax.

Prices f.o.b. Chicago. Each price subject to discount of 1 cent per gallon for 150-gal. lots if covered by contract.

Canada*

3-Star Imperial Gasoline
IMPERIAL OIL, LTD.

	Gasoline Tank wag.	Incl. tax	Kero. tank wag.
Halifax, N. S.	24.5	10.0	18.0
St. John, N. B.	24.5	10.0	18.0
Montreal, Que.	24.0	8.0	16.5
Toronto, Ont.	24.5	8.0	17.0
Hamilton, Ont.	24.5	8.0	17.0
Winnipeg, Man.	27.5	7.0	22.5
Brandon, Man.	28.0	7.0	22.5
Regina, Sask.	25.0	7.0	20.0
Saskatoon, Sask.	28.0	7.0	23.0
Edmonton, Alta.	25.9	7.0	20.0
Calgary, Alta.	23.0	7.0	18.0
Vancouver, B. C.	21.0	7.0	23.0

*Imperial gallon used in Canada.

Divided dealers pay tank-wagon prices. Discount to undivided dealers, 1 cent below tank-wagon price. In Maritime Provinces both divided and undivided dealers pay tank-wagon price.

Tank-Wagon Changes

Standard Oil Co. (Kentucky) made two reductions of 0.5 cent each on the tank-wagon price of regular gasoline at Jackson, Miss., one on February 12 and the other on February 15. The company reduced regular gasoline 1 cent per gallon February 15 at Macon, Ga.

Atlantic Refining Co. reduced kerosene tank-wagon price 0.5 cent per gallon at Philadelphia February 20.

Socony-Vacuum Oil Co., Inc., reduced the dealer tank-wagon price of regular gasoline 0.9 cent per gallon February 21 at Albany, N. Y.

Standard Oil Co. of Louisiana reduced dealer tank-wagon price on kerosene 1 cent at Nashville, Tenn., February 11 and made a similar reduction at Chattanooga, Tenn., February 21.

PRICES OF REFINED PRODUCTS...

All quotations f.o.b. plant in cars for interstate or export movement except as otherwise noted

Prices as of March 4, 1941
(Most prices in cents per gallon)

The quotations are exclusive of the federal excise taxes of 1 cent a gallon on gasoline and 4 cents a gallon on lubricating oils. Octane ratings in Middle West, Mid-Continent, and Southwest are based on A.S.T.M. method of testing.

Refinery Gasoline

OKLAHOMA (Group 3)—

U. S. Motor grades:		
72-74 octane (regular)	.04⅜	.04⅝
63-66 octane	.04	.04¼
60 octane and below	.03⅝	.03¾
60-62 400 grades:		
72-74 octane (regular)	.04⅜	.04⅝
63-66 octane	.04	.04¼
60 octane and below	.03⅝	.03¾

NORTH TEXAS—

U. S. Motor grades:		
72-74 octane (regular)	.04⅜	.04½
63-66 octane	.03⅞	.04⅛
60 octane and below	.03⅝	.03¾
60-62 400	.03⅝	.04½

NORTH LOUISIANA (Ark. and N. La. delivery)—

U. S. Motor grades:		
72-74 octane (regular)	.04⅜	.04½
63-66 octane	.03⅞	.04⅛
60 octane and below	.03¾	.03⅞

ARKANSAS (Ark. and N. La. del.)—

U. S. Motor grades:		
72-74 octane (regular)	.04⅜	.04½
60 octane and below	.03⅝	.03¾

CHICAGO (Based on Group 3)—

U. S. Motor grades:		
72-74 octane (regular)	.04⅜	.04⅝
63-66 octane	.04	.04⅜
60 octane and below	.03⅝	.03¾
60-62 400 grades:		
72-74 octane (regular)	.04⅜	.04⅝
63-66 octane	.04	.04¼
60 octane and below	.03⅝	.03¾

PENNSYLVANIA (inland refineries)—

74-76 octane (regular)	.06
72-74 octane	.05¾

CALIFORNIA (domestic movement)—

58-60 400, 65 oct. and higher	.05½	.07¼
54-58 U. S. Motor	.04½	.06¼

EAST COAST (domestic)—

U. S. Motor grades:		
New York (Bayonne)*	.05½	.05¾
Philadelphia	.05½	.06¾
Boston	.05½	.06
Baltimore	.05½	.06¾
Charleston, S. C.	.06¼	.06½

*All grades of gasoline ⅛ to ¼ cent less for barge shipments. New York Harbor prices are for New York and New England delivery. Prices for New Jersey delivery ¼ cent lower.

GULF COAST (domestic)—

U. S. Motor grades:		
72-74 octane (leaded)	.04½	.04¾
70-72 octane (unleaded)	.04½	.04⅝
68-70 octane (unleaded)	.04¼	.04½
Below 68 octane (unleaded)	.04	.04¼

Natural Gasoline

OKLAHOMA (Group 3)—

Grade 26-70	.02½	.02⅝
Grade 18-55	.03	.03¼

NORTH TEXAS—

Grade 26-70		.02¼
Grade 18-55	.02⅝	.02¾

CALIFORNIA—

75-85 375-390	.04½	.05¼

NORTH LOUISIANA (Ark. and N. La. delivery)—

Grade 26-70	.02¼

Tractor Fuel

OKLAHOMA (Group 3)—

40-42 gr., 315-325 l.b.p., 110-flash, 540-550 e.p.	.03½	.03⅝
41-43 gr., 300-320 l.b.p., 110-125 flash, 500-520 e.p.	.03⅝	.03¾
46-48 gr., 210-230 l.b.p., 480-max., e.p.	.03⅞	.04

Kerosene

(All kerosene water white)

OKLAHOMA (Group 3)—

42-44	.04¼	.04⅜
41-43	.04⅛	.04¼

NORTH TEXAS—

41-43	.04	.04⅛

NORTH LOUISIANA (Ark. and N. La. delivery)—

41-43	.04	.04⅛

ARKANSAS (Ark. and N. La. del.)—

41-43	.04	.04¼

PENNSYLVANIA (inland refineries)—

46	.05¼	.05½
45	.05⅛	.05¼

CHICAGO (Based on Group 3)—

42-44	.04¼	.04⅜
41-43	.04⅛	.04¼

CALIFORNIA (Pac. Coast market)—

38-40 high-burning test	.04½	.05½

NEW YORK (Bayonne, N. J.)—

41-43	.046	.049

GULF COAST (domestic)*—

41-43	.03⅛	.03½

*Barge price ⅛ cent lower.

Furnace Oil

OKLAHOMA (Group 3)—

Range oil	.03⅞	.04⅛
No. 1 prime white, 38-42	.03¾	.04
No. 1 straw, 38-40	.03⅝	.04
No. 2 straw, 32-36	.03⅜	.03⅝
No. 3 zero to 10, 28-32	.03¼	.03½

NORTH TEXAS—

No. 1 prime white, 38-42	.03⅜	.03⅞
No. 1 straw, 38-40	.03⅞	.03⅜

NORTH LOUISIANA (Ark. and N. La. delivery)—

No. 2, 32-36	.03½	.03⅝

ARKANSAS (Ark. and N. La. del.)—

No. 2, 32-36	.03½	.03⅝

CHICAGO (Based on Group 3)—

Range oil	.03⅞	.04⅛
No. 1 prime white, 38-42	.03¾	.04
No. 2 straw, 32-36	.03⅜	.03⅝
No. 3 zero to 15, 28-32	.03¼	.03½

NEW YORK (Bayonne, N. J.)—

*No. 1	.046	.049
*No. 2	.040	.043
*No. 4		.043

*Barge deliveries ⅛ to ¼ cent under above tank-car price.

Gas Oil and Fuel Oil

(Gas oil per gal., fuel oil per bbl.)

OKLAHOMA (Group 3)—

U.G.I. gas oil, under 35	.03⅛	.03¼
No. 5, low pour point, 18-22	.75	.80
No. 6, 15 and above, 8-14	.60	.65

NORTH TEXAS—

U.G.I. gas oil, under 35	.03	.03⅛
No. 5, low pour point, 18-22	.75	.80
No. 6, 15 and above, 8-14	.60	.65

NORTH LOUISIANA (Ark. and N. La. delivery)—

10-14 fuel oil, industrial		.70

CHICAGO (Based on Group 3)—

U.G.I. gas oil	.03⅛	.03¼
No. 5, low pour point, 18-22	.75	.80
No. 5, 15 and above, 18-22	.60	.70
No. 6, low pour point, 10-16	.60	.70
No. 6, 15 and above, 8-14	.60	65

PENNSYLVANIA (inland refineries)—

36-40	.04½	.05

CALIFORNIA—

Los Angeles:		
30-40 gas oil, per bbl.	1.10	1.25
24 plus diesel, per bbl.	1.10	1.25
24 plus diesel (bunkers)	1.20	1.35
12-16 (bunkers at tidewater)	.65	.75
10-16 (cargo lots)	.65	.75
12-17 (tank cars)	.60	.75
10-17 (high sulfur)	.50	.65
San Joaquin Valley:		
10-18 (tank cars)	.55	.70
24 plus diesel, per bbl.	1.10	1.25
San Francisco:		
24 plus diesel, per bbl.	1.35	1.40
24 plus diesel (bunkers)	1.40	1.50
10-16 (bunkers)	.75	.80

GULF COAST—

No. 2 fuel	.03	.03⅛
43-47 diesel	.03⅛	.03⅛
48-52 diesel	.03⅛	.03⅜
53-57 diesel	.03⅛	.03⅜
58-and-above diesel	.03⅜	.03¾
Diesel bunkers		1.40
Bunker C (bulk cargoes)	.72½	.75
Bunker C (bunkers)		.80

NEW YORK (Bayonne, N. J.)—

27 plus, gas oil		.044
28-30 diesel (lighterage 6¼c per bbl.)		1.65
28-30 diesel (tank cars)		.043
Bunker C (to ocean-going ships in N. Y. Harbor)		1.25
Industrial fuel (tank cars)	.0315	.035

Lighterage charge 5c bbl. additional.

Bright and Steam Refined

OKLAHOMA (Group 3)—

200-210 D, 10-25		.18
150-160 D, 0-10		.13½
150-160 D, 10-25		.13
100-110 D, 0-10		.13
100-110 D, 10-25		.12½
Steam refined:		
600 dark green (untreated)		.07

PENNSYLVANIA—

Bright Stocks (Pennsylvania Grade No. 8 color, 140-150 at 210, 545-550 flash):		
10 pour point		.16½
15 pour point		.15½
25 pour point		.14
Steam refined:		
600		.09
650	.09	.11
600 flash	.09½	.12
630 flash	.11	.12

Neutral Oil

(Vis. at 100° F. except Pennsylvania and color N.G.A.)

OKLAHOMA (Group 3)—

0-10 pour point:		
150-3		.08
180-3		.08½
200-3		.08½
250-3		.10
280-3		.10½
280-4		.10
300-3½		.11
350-3½		.11½
400-3½		.12
500-3½		.12½
600-3½		.13
100-2½ paraffin oil 10-25		.05¼
10-25 pour point:		
200-3		.08
250-3		.09½
280-3		.10
280-4		.09½

GULF COAST—

Pale oils:		
100-3	.05⅛	.05¼
200-3	.07⅛	.07¼
300-3	.07⅛	.07⅜
500-3½	.08¼	.08½
750-3½	.08⅜	.08⅝
1,200-3½	.08¾	.08⅞
2,000-4		.09
3,000-4		.10½
Red oils:		
200-5-6	.06⅞	.07
300-5-6	.07¼	.07½
500-5-6	.08	.08¼
750	.08⅜	.08½
1,200-5-6	.08½	.08⅝

CALIFORNIA (moving to dom. market)—

Pale oils:		
100-2½-3	.07¼	.08
200-2½-3	.07¼	.08
300-2½-3	.07¼	.08
400-3-4	.07¼	.08
450-3-4	.07¼	.08
550-3-4	.09	.11
600-3-4	.09	.11
Red oils:		
200-4-5	.07¼	.08
300-5-6	.07¼	.08
350-5-6	.09¼	.11½
400-5-6	.09¼	.11½
450-5-6	.09¼	.11½
500-5-6	.09¼	.11½
600-5-6½	.09¼	.11½
700-6½ plus	.09¼	.11½
750-6½ plus	.09¼	.11½
900-6½ plus	.09¼	.11½

PENNSYLVANIA—

150 vis. at 70° F., 3 color, 400-405 flash:	
Zero pour point	.22½
10 pour point	.21½
15 pour point	.20½
25 pour point	.19
200 vis., at 70° F., 3 color:	
Zero pour point	.24½
10 pour point	.23½
15 pour point	.22½
25 pour point	.21

Wax and Petrolatum

(Prices per pound)

OKLAHOMA (Group 3)—

124-126 (A.m.p.) w.c. scale	.02½	.02¾

PENNSYLVANIA (inland refineries)—

122-124 (A.m.p.) w.c. scale	.02½	.02¾
124-126 (A.m.p.) w.c. scale	.02½	.02¾

NEW YORK—

Wax in bags fully refined:		
125-127 (A.m.p.) wax		.0560
128-130 (A.m.p. wax		.0560
130-132 (A.m.p.) wax		.0585
133-135 (A.m.p.) wax		.0615
135-137 (A.m.p.) wax		.0640
Crude scale:		
124-126 (A.m.p.) w.s.	.02¼	.02½
124-126 (A.m.p.) y.s.	.02¼	.02½
Petrolatum in barrels, carload lots:		
Dark green	.02125	.02625
Amber	.02375	.02875
Extra amber	.02625	.03000
Lily white	.04375	.05125
Snow white	.05125	.06000
Cream	.03375	.04125

Export Prices

GASOLINE

GULF COAST—

60-62 400	.03¼	.04
61-63 390	.03¼	.04
64-66 375	.03¼	.04

LOS ANGELES—

U. S. Motor grades:		
Above 69 octane	.05½	.05⅝
65-69 octane	.05¼	.05½
60-65 octane	.04½	.05

KEROSENE

GULF COAST—

41-43 water white	.03½	.03⅝

LOS ANGELES—

41-43 water white	.05	.05¼

LUBRICANTS

(Pennsylvania Grade)

NEW YORK (f.o.s. in bbl.)—

Cylinder stocks:	
600 S.R. unfiltered	.18
630 S.R. unfiltered	.18¼
600 flash, S.R.	.18½
650 flash, S.R.	.20
Bright stock:	
Light, 25 pour point	.22

NEUTRAL OIL

200-3 color	.28½
150-3 color	.27

PARAFFIN WAX

NEW YORK (prices per lb.)—

123-125 A.m.p.		.0560
125-127 A.m.p.		.0560
128-130 A.m.p.		.0585
133-135 A.m.p.		.0615
135-137 A.m.p.		.0640
Crude scale:		
124-126 w.s.	.02½	.02⅝
124-126 y.s.	.02½	.02⅝

CRUDE-OIL PRICES . . .

Oklahoma, Kansas, North Central and East Central Texas

East Texas (Oct. 11, 1938)* $1.10
Sinclair Prairie Oil Marketing Co. October 2, 1939. De Soto Pipe Line October 2, 1939. Cities Service Co. October 5, 1939. Shell Oil, Inc., October 5, 1939.
Van, Tex. (Oct. 11. 1938)* $0.93
Talco, Tex. (Oct. 2, 1939)*‡ ..... .65
Rodessa, Tex. .....
See North Louisiana gravity schedule
Cass and Panola counties, Texas ...
See note below
Altus and Tipton† ..... See note below
Cayuga, Tex. (Oct. 2, 1939) $0.78
Clay Creek, Tex. ..... .85
Long Lake, Tex. (Jan. 20, 1940) ... 1.08

*Humble Oil & Refining Co. †Gulf Refining Co. Pure Oil Co.'s Van price, 93 cents, effective Oct. 13, 1938. ‡Magnolia Petroleum Co. (effective Mar. 1, 1941).

Cass and Panola counties, Texas, effective October 12, 1938, by Magnolia Petroleum Co., same as North Louisiana prices in Column 5 gravity schedule.

Altus and Tipton, Oklahoma, starting at below 25° at 71 cents, 2-cent spread to 40° and above at $1.03. Cayuga posted by Pan American Pipe Line Co. Clay Creek by Sun Oil Co. Long Lake by Sinclair Oil Marketing Co.

West Texas

See gravity table.
Fisher County, Texas (Apr. 1, 1939)
See note below
Pecos County (Oct. 11, 1938)* $0.78
Pecos shallow (Oct. 11, 1938)† ..... .65

*Shell Oil Co., Inc., Gulf Pipe Line Co. and Humble Oil & Refining Co. †Shell Oil Co., Inc.

Fisher County, Texas, by Shell Oil Co., Inc., below 25°, 68 cents; 25°, 70 cents, with 2-cent spread to 40° and over at $1. Cochran and Hockley counties, Texas, by Texas Co. (Mar. 1, 1941) flat price of 70 cents.

NORTH LOUISIANA AND SOUTHERN ARKANSAS

(Posted by Standard Oil Co. of Louisiana, Stanolind Oil & Gas Co., Lion Oil Refining Co. and Arkansas Fuel Oil Co.)

(Effective 7 a.m. October 17, 1940)

	1	2	3	4	5
Below 21	$.55	...	...	$.75	$.91
21-21.9	.57	...	...	.77	.93
22-22.9	.59	...	...	.79	.95
23-23.9	.61	...	...	.81	.97
24-24.9	.63	$.73	$.83	.83	.99
25-25.9	.65	.75	.85	.85	1.01
26-26.9	.67	.77	.87	.87	1.03
27-27.9	.69	.79	.89	.89	1.05
28-28.9	.71	.81	.91	.91	1.07
29-29.9	.73	.83	.93	.93	1.09
30-30.9	.75	.85	.95	.95	1.11
31-31.9	.77	.87	.97	.97	1.13
32-32.9	.79	.89	.99	.99	1.15
33-33.9	.81	.91	1.01	1.01	1.17
34-34.9	.83	.93	1.03	1.03	1.19
35-35.9	.84	.94	1.04	1.04	1.20
36-36.9	.85	.95	1.05	1.05	1.21
37-37.9	.86	.96	1.06	1.06	1.22
38-38.9	.87	.97	1.07	1.07	1.23
39-39.9	.88	.98	1.08	1.08	1.24
40 and above	.89	.99	1.09	1.09	1.25

Column 1 applies to Atlanta, Buckner, Magnolia, Schuler (Jones sand and Reynolds lime) and Village fields. The Phillips Petroleum Co. schedule for Jones sand (Schuler field) maintains a 2-cent differential to a top of 95 cents for 40° gravity oil.

Column 2 applies to Caddo, De Soto, Sabine, Fouke, Homer, Miller County, Sugar Creek, El Dorado (West, South and Rainbow) and Schuler (Morgan sand).

Column 3 applies to Bunkie, Eola and Olla.

Column 4 applies to Bayou Des Glaise, Bayou Mallet, Choctaw, Darrow, Jeanerette, Lirette, North Crowley, Port Barre, Potash, Roanoke and St. Martinville.

Column 5 applies to University (Baton Rouge).

Big Creek, Dorcheat, McKamie distillates (sour)	$.95
Smackover (heavy)*	.73
Cotton Valley distillate	1.10
Cotton Valley crude	1.05
Coton Valley (Holloway sand crude)	1.10
Rodessa, Shreveport (Cross Lake)	1.05
Schuler (Morgan sand), El Dorado and Rainbow	.73-1.05
Tullos and Urania	.89
Lisbon, La. (Apr. 29, 1939)	.66-.82

Note—Stanolind purchases in Caddo Parish only.

*Smackover posted by Magnolia Petroleum Co., Oct. 12; by Gulf Refining Co., Oct. 13; McMillan Refining Co. and Cross Refining Co. met price. Tullos and Urania posted by Hunt Oil Co.

In the Lisbon, Louisiana, field, effective Sept. 14, 1939, Gulf Refining Co. and Caddo Crude Oil Purchasing Co. posted 27-27.9°, 66 cents, with 2 cents added for each degree up to 35 and over at 82 cents.

Gulf Coast

Seabreeze, Willow Slough, and LaBelle, Tex. (Sept. 14, 1938)***	$1.10
Conroe, Tex. (Oct. 11, 1938)*	1.27
Black Bayou and White Castle, La. (Oct. 11, 1938)‡	See note below
Gibson, La. (Oct. 11, 1938)†	$1.04
Garden Island, La. (Oct. 12, 1938)‡	1.24
Lafitte, La. (Oct. 12, 1938)‡	1.04
Cleveland, Tex. (Oct. 12, 1938)¶	1.14
Hardin, Tex. (Sept. 14, 1939)*	1.10
Tepetate, La. (Oct. 11, 1938)§	1.03
Ville Platte, La. (Oct. 11, 1938)§	1.03
Abbeville, La. (Jan. 1, 1939)§	See note below
Bosco, La. (Dec. 3, 1938)‖	$0.93
Creole, La. (Oct. 13, 1938)‖	.96
Vinton, Edgerly, Starks, Hackberry, Timbalier Bay, Quarantine Bay, and Grand Bay, La. (Oct. 2, 1939)**	
Segno and Wing (Oct. 2, 1939)**	See note below
Happytown, La. (Jan. 12, 1940)† ...	1.00
Livingston (Oct. 11, 1938)†	$1.10

*Humble Oil & Refining Co. †Shell Oil Co., Inc., ‡Texas Co. §Continental Oil Co. ‖Pure Oil Co. ¶Magnolia Petroleum Co. **Gulf Refining Co. ***Sun Oil Co. Hardin prices by Humble and Sun companies.

Black Bayou, etc., starts at below 20° at 79 cents; 20°-20.9°, 81 cents; 21°-21.9°, 83 cents; then a 3-cent spread to 26°-26.9°, 98 cents; then a 2-cent spread at 40° and over at $1.14. Abbeville starts at below 36°, 92 cents; 2-cent spread to 40° and over at $1.02. Segno and Wing take Gulf Refining Co.'s Gulf Coast prices. Vinton, Edgerly, etc., schedule starts at below 20°, 86 cents, 2-cent spread to 34° and above at $1.16. Shell Oil Co., Inc., withdrew as a purchaser in the Schwab-Wilcox area, Texas, on Apr. 8, 1940.

Hackberry, East and West, effective October 2, 1939, by Stanolind Oil & Gas Co. Below 20 gravity 86 cents, 2 cents added for each degree up to 34° and over at $1.16.

Iowa, La., effective October 11, 1938, by Shell Petroleum Corp. and on April 1, 1939, by Shell Oil Co., Inc.: Below 18°, 75 cents; 18°-18.9°, 77 cents; 2-cent spread to 21°-21.9° at 83 cents; then a 3-cent spread to 26°-26.9° at 98 cents; then a 2-cent spread to 34° and above at $1.14.

PURE OIL CO.

(Effective January 22, 1941)

Creole, Cameron Parish, La.	$1.01
Gueydan light, Vermilion Parish, La.	1.03
Gueydan heavy, Vermilion Parish, La.	.89
Sweet Lake, Cameron Parish, La. ..	.91

Crude Prices by Gravities

Gravity—	Oklahoma and Kansas 1	Oklahoma and Kansas 2	Oklahoma and Kansas 3	North and Central Texas 4	Louisiana and Arkansas 5	East Central Texas 6	Gray County, Texas 7	Carson and Hutchinson Counties, Texas 8	West Texas, and Lea County, N. M. 9	Raccoon, Satsuma, and Tomball, Texas 10	Gulf Coast 11	Anahuac, Dickinson, Texas 12	Refugio, Texas 13	Mirando-Duval, Beaumont-West Beaumont, Texas 14	Golden Meadow, Louisiana 15	Lockport, Iowa, Cameron Meadows, Louisiana 16	Clara Driscoll 17	Artesia, Jackson, Maljamar, N. M. 18
Below 18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	$.74	...	...
18-18.9	...	...	...	...	...	...	...	...	$.53	...	...	...	...	...	...	.76	...	...
19-19.9	...	...	...	...	...	...	...	...	.53	...	$.86	$.81	$.91	$.86	...	.78	...	...
20-20.9	$.70	...	$.60	...	...	...	...	...	.55	...	.88	.83	.93	.88	...	.80	$.93	...
21-21.9	.72	...	.63	...	...	...	...	...	.57	...	.90	.85	.95	.90	...	.82	.95	...
22-22.9	.74	...	.66	...	...	...	...	...	.59	$.95	.92	.87	.97	.92	...	.85	.97	...
23-23.9	.76	...	.69	...	...	$.78	...	...	.61	.97	.94	.89	.99	.94	...	.88	.99	...
24-24.9	.78	...	.72	$.71	$.73	.80	...	...	.63	.99	.96	.91	1.01	.96	$.90	.91	1.01	...
Below 25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
25-25.9	.80	$.58	.75	.73	.75	.82	...	...	.65	1.01	.98	.93	1.03	.98	.90	.94	1.03	...
26-26.9	.82	.63	.78	.75	.77	.84	...	...	.67	1.03	1.00	.95	1.05	1.00	.90	.97	1.05	...
27-27.9	.84	.68	.81	.77	.79	.86	...	...	.69	1.05	1.02	.97	1.07	1.02	.90	.99	1.07	...
28-28.9	.86	.73	.84	.79	.81	.88	$.72	$.67	.71	1.07	1.04	.99	1.09	1.04	.90	1.01	1.09	$.61
29-29.9	.88	.78	.87	.81	.83	.90	.74	.69	.73	1.09	1.06	1.01	1.11	1.06	.90	1.03	1.11	.63
30-30.9	.90	.82	.90	.83	.85	.92	.76	.71	.75	1.11	1.08	1.03	1.13	1.08	.90	1.05	1.13	.65
31-31.9	.92	.86	.92	.85	.87	.94	.78	.73	.77	1.13	1.10	1.05	1.15	1.10	.92	1.07	...	.67
32-32.9	.94	.90	.94	.87	.89	.96	.80	.75	.79	1.15	1.12	1.07	1.17	1.12	.94	1.09	...	.69
33-33.9	.96	.96	.96	.89	.91	.98	.82	.77	.81	1.17	1.14	1.09	1.19	1.14	.96	1.11	...	.71
34-34.9	.98	.98	.98	.91	.93	1.04	.84	.79	.83	1.19	1.16	1.11	1.21	1.16	.98	1.13	...	.73
35-35.9	1.00	1.00	1.00	.93	.95	1.02	.86	.81	.85	1.21	1.18	1.13	1.23	1.18	1.00	...	...	.75
36-36.9	1.02	1.02	1.02	.95	.97	1.04	.88	.83	.87	1.23	1.20	1.15	1.25	1.20	1.02	...	...	.77
37-37.9	1.04	1.04	1.04	.97	.99	1.06	.90	.85	.89	1.25	1.22	1.17	1.27	1.22	1.04	...	...	.79
38-38.9	1.06	1.06	1.06	.99	1.01	1.08	.92	.87	.91	1.27	1.24	1.19	1.29	1.24	1.06	...	...	.81
39-39.9	1.08	1.08	1.08	1.01	1.03	1.10	.94	.89	.93	1.29	1.26	1.21	1.31	1.26	1.08	...	...	.83
40 and over	1.10	1.10	1.10	1.03	1.05	1.12	.96	.91	.95	1.31	1.28	1.23	1.33	1.28	1.10	...	...	.85

Column 1—Effective October 17, 1938, by Standard Oil Co. of Indiana. By Gulf Refining Co., October 13, 1938. Carter Oil Co. schedule and prices same from 30° upward, but on lower gravities pays below 21° 60 cents, with 3 cents added for each degree up to and including 29-29.9°, effective October 13, 1938. Gulf Oil Corp. starts at below 25° 78 cents, October 13, 1938. Texas Co. schedule starts at 28-28.9° at 86 cents. Pure Oil Co. same as Standard of Indiana's schedule, effective October 14, 1938.

Column 2—Sinclair Prairie Oil Marketing Co. February 16, 1939.

Column 3—Magnolia Petroleum Co. effective October 12, 1938; Shell Petroleum Corp., October 22, 1938; Shell Oil Co., Inc., April 1, 1939.

Column 4—Effective December 3, 1938, by Humble Oil & Refining Co. in Central Texas. By Magnolia Petroleum Co. in East Central and in North and Central Texas, excepting that it starts at below 29° at 79 cents, effective December 3, 1938. Texas Co. in North and Central Texas, same as Magnolia's but effective October 12, 1938. Gulf Refining Co. same as Magnolia's, effective October 13, 1938. Stanolind Oil Purchasing Co. in North Texas, schedule starts at below 21°, 63 cents, with a 2-cent spread upward to 40° and over at $1.03, effective September 1, 1940.

Column 5—Gulf Refining Co., October 13; Texas Co. October 12.

Column 6—Humble Oil & Refining Co., October 11, 1938.

Column 7—Humble Oil & Refining Co., effective December 3, 1938. Sinclair Prairie Oil Marketing Co., October 11, 1938. Texas Co. quotes "Panhandle sweet crude," beginning with 34-34.9°, at 84 cents, with 2-cent spread to 40° and over at 96 cents, and "Panhandle sour crude," 79 cents for 34-34.9°, with a top of 91 cents for 40° and over, effective October 12. Magnolia Petroleum Co. met Humble prices throughout, effective December 3. Gulf Refining Co. quotes "Panhandle sweet crude" at below 29°, 72 cents with a 2-cent spread, and a top price of 96 cents for 40° and above, and "Panhandle sour crude" below 29°, 67 cents, with a top of 91 cents for 40° and above effective October 13. Phillips Petroleum Co. schedule for sweet crude in Gray, Carson, and Hutchinson counties, starts at below 29°, 72 cents, with a spread of 2 cents up to 96 cents for 40° and over, effective February 7, 1939.

Column 8—Humble Oil & Refining Co., effective December 3, 1938. Sinclair Prairie Oil Marketing Co., October 11, 1938. Texas Co. quotes "Panhandle sweet crude" at 34-34.9°, 84 cents, with a top of 96 cents for 40 gravity, and "Panhandle sour crude" at 34-34.9°, 79 cents, with a top of 91 cents for 40° and over, effective October 12. Gulf Refining Co. quotes "Panhandle sweet crude" at below 29°, 72 cents, with a top of 96 cents for 40° and over and "Panhandle sour crude" at below 29°, 67 cents, with a top of 91 cents for 40° and above, effective October 13. Phillips Petroleum Co. schedule for sour crude in Carson, Moore, and Hutchinson counties, starts at below 29° at 67 cents, with a spread of 2 cents up to 91 cents for 40° and over, effective February 7, 1939.

Column 9—Humble Oil & Refining Co., effective October 11, 1938. Texas Co. schedule starts at below 26°, 65 cents, and ends at 36° and over at 87 cents, effective October 12. Gulf Refining Co. starts at below 26° at 65 cents and ends at 40° and over at 95 cents, effective October 13. Magnolia Petroleum Co. schedule starts below 25°, 63 cents, and ends at 40° and above at 95 cents, effective October 12. Sinclair Prairie Oil Marketing Co. schedule same as that of Magnolia, effective October 11, but revised on March 24, 1939, to stop at 36° and over at 87 cents. Stanolind Oil Purchasing Co. schedule same as that of Humble, effective October 11. Stanolind Oil & Gas Co. (Winkler County) starts at below 26°, 65 cents, with a 2-cent spread, and a top of 95 cents for 40° and above, effective October 11, 1938. Effective September 1, 1939, Shell Oil Co., Inc., posted Yoakum County crude, starting at below 20°, 53 cents, with 2 cents added for each degree up to 36° and over at 87 cents. Effective March 31 Atlantic Refining Co. added Gaines Cou ty to its price schedule.

Column 10—Humble Oil & Refining Co., effective October 11, 1938. Magnolia Petroleum Co., in Tomball, effective October 12.

Column 11—Effective October 2, 1939, by Humble Oil & Refining Co. in Texas Coast. By Sinclair Prairie Oil Marketing Co. in Texas Coast, October 3, 1939. By Texas Co. at $1.16 in Texas and Louisiana Coast, October 2, 1939, schedule stopping at 34° and over. By Sun Oil Co. in Texas and Louisiana Coast, October 2, 1939. By Gulf Refining Co. in Louisiana October 2, 1939, excepting that schedule stops at $1.16 for 34° and above. By Gulf Refining Co. in Texas, effective November 1, 1939.

Column 12—Effective by Humble Oil & Refining Co. October 2, 1939. By Sun Oil Co. in Anahuac, October 2, 1939. By Gulf Refining Co. in Anahuac, October 2, 1939. On November 1, 1939, Gulf Refining Co. applied these prices to Anahuac, Hull (New), Pierce Junction, Orange, Thompson (deep).

Column 13—Effective October 2, 1939, by Humble Oil & Refining Co. and Continental Oil Co. By Texas Co. up to 28° and over at $1.09 October 2, 1939. Atlantic adopted Humble price schedule November 7, 1939, in Refugio and applied it also to Greta.

Column 14—Effective October 2 by Humble Oil & Refining Co. By Sun Oil Co. in Mirando alone, stopping at 24-24.9° at 96 cents. By Stanolind Oil & Gas Co. in West Beaumont, alone, October 2, 1939. Gulf Refining Co. in West Beaumont, October 2, 1939. By Magnolia Petroleum Co. in Beaumont, October 2, 1939. By Texas Co. in Duval and Mirando, stopping at 28-28.9° at $1.09. Continental Oil Co. in Mirando and Duval, October 2, 1939. By Pure Oil Co. in Louise, Wharton County and Ganado, Jackson County, on October 23, 1940.

Column 15—Effective October 2, 1939, by Texas Co.

Column 16—Magnolia Petroleum Co., effective October 12 1938.

Column 17—Continental Oil Co. for Minnie Bock, Clara Driscoll, S. Clara Driscoll and Driscoll ranch.

Column 18—Continental Oil Co., effective October 11, 1938.

Southwest Texas

Salt Creek, Darst Creek, Hilbig, Carroll, Clark and Zoboroski (Oct. 11, 1938)* $0.96
Pettus (Oct. 11, 1938)* 1.29
Flour Bluff (Dec. 3, 1938)* 1.23
Jim Wells County (Oct. 2, 1939)* 1.23
Darst Creek (Oct. 12, 1938)† ..... .96
Darst Creek and Bruner (Oct. 13, 1938)‡ $0.96
Luling (Oct. 12, 1938)† ..... .87
Mirando (Oct. 12, 1938)† ..... .87
Government Wells (Oct. 13, 1938) See note below

*Humble Oil & Refining Co. †Magnolia Petroleum Co. Pettus price adopted by Lytton Springs (Oct. 12, 1938)† ..... .99
Atlantic Crude Oil Purchasing Co. ‡Gulf Refining Co.

Government Wells posted by Sun Oil Co. starts at 20° at 77 cents, 3-cent spread to 24°-24.9° at 89 cents.

Middle Western States

OHIO OIL CO.
(Effective August 21 and 23, 1940)

Illinois old fields $1.00
Illinois basin 1.15
Illinois (Storms field) (Feb. 1, 1941) 1.10
Princeton, Ind. 1.00
Western Kentucky (Aug. 21, 1940)† 1.10
Birk City, Ky. (Jan. 1, 1941)¶ ..... .95
Corydon, Ky. (June 9, 1939) ..... .90
Greendale, Porter, Crystal, Vernon and Wise. Mich. (Jan. 2, 1941)*‡ 1.22
Buckeye, Bentley, Monitor (sweet crude), Edenville, Beaverton, Mich. (Jan. 2, 1941)* 1.20
Freeman-Redding and Lincoln (Jan. 2, 1941)*‡ 1.17
West Branch, Adams-Arenac, Mich. (Jan. 2, 1941)*‡ 1.02
Hamilton-Grout, Mich. (Jan. 2, 1941)* 1.67
Allegan-Kent and Ottawa, Mich. (Jan. 16, 1941) 1.23
Bloomingdale and Columbia. Mich. (Jan. 16, 1941)¶ 1.23
Muskegon 1.00
Sherman and Freeman, Mich. (Aug. 25, 1940)‡ 1.17
Midland, Mich. (Jan. 2, 1941)‡ 1.22
Eastern Kentucky:
Big Sandy River (Aug. 21, 1940)† 1.12
Kentucky River (Aug. 21, 1940)† 1.20

*Simrall Corp. †Ashland Refining Co. ‡Pure Transportation Co. ¶Sohio Corp. Bloomingdale posted by Tri-Lakes Corp. Kent County by Naph-Sol Refining Co. On May 25, 1940, Sohio posted $1 per barrel in the Griffin field in Gibson County, Indiana, and Wabash County, Illinois, and the North Griffin, South Griffin, Phillipstown, New Harmony and Irons in Wabash and White counties, Illinois. Allegan, Kent and Ottawa posted by Commonwealth Pipe Line Co.

Rocky Mountain States

Dry Creek, Wyo. (Oct. 11, 1938)*.. $0.92
Elk Basin, Wyo. (Oct. 11, 1938)*† .90
Grass Creek, light, Wyo. (Oct. 11, 1938)*† ..... .90
Grass Creek, heavy (Oct. 11, 1938)† .40
Lance Creek, Wyo. (Oct. 11, 1938)* .77
Rock Creek, Wyo. (Oct. 11, 1938)* .. 1.00
Iles, light, Colo. (Oct. 11, 1938)† .98
Iles, heavy, Colo. (Oct. 11, 1938)† .92
Dutton Creek, Wyo. (Oct. 11, 1938)† See note below
Frannie, light, Wyo. (Oct. 11, 1938)† $0.55
Frannie, heavy, Wyo. (Oct. 11, 1938)† .42
Hamilton dome, Wyo. (Oct. 11, 1938)† ..... .35
See note below
Midway, Wyo. (Oct. 11, 1938)† .....
Salt Creek Tensleep Crude, Wyo. (Oct. 11, 1938)† $0.646
Salt Creek (Oct. 11, 1938) See note below
Canon City, Colo. (Oct. 11, 1938)‡.. $0.90
Florence, Colo. (Oct. 11, 1938)‡.... .90
Cut Bank, Mont. (Jan. 1, 1940) 1.00
Kevin-Sunburst, Mont. (Jan. 1, 1940) .80
Cat Creek, Mont. (Oct. 11, 1938)‡.... 1.10
Big Muddy, Wyo. (Oct. 11, 1938)‡.... .98
Lance Creek, Wyo. (Oct. 11, 1938)‡. .77
Lea County, New Mexico ..... See West Texas gravity schedule‡
Artesia, Jackson and Maljamar ..... See gravity table‡
Fort Collins and Wellington, Colo. See note below
Eddy County, New Mexico (Oct. 11, 1938)§ $0.77

*Ohio Oil Co. †Stanolind Oil & Gas Co. ‡Continental Oil Co. §Sinclair Prairie Oil Marketing Co.

Dutton Creek and Salt Creek Tensleep crudes start at below 29°, 86 cents, 2-cent spread up to 40° and over at $1.10. Salt Creek crude, excepting Tensleep, takes Standard Oil Co. of Indiana's Oklahoma-Kansas prices. Stanolind Oil & Gas Co., effective Oct. 11, discontinued posting prices in Greybull-Torchlight, Wyoming, and Hogback and Hospah, New Mexico. In Fort Collins and Wellington, Colorado, effective Oct. 11, 1938, by Continental Oil Co. 28-28.9°, 81 cents, with 2 cents added for each degree up to 40° and over at $1.05. Cut Bank and Kevin-Sunburst posted by Producers Refining Co.

Eastern States

SOUTH PENN OIL CO.
(Effective January 27, 1941)

Pennsylvania Grade oil in National Transit lines (Bradford field) $2.30
Pennsylvania Grade oil in Southwest Pennsylvania lines 1.95
Pennsylvania Grade oil in Eureka Pipe Line lines 1.89
Corning grade oil in Buckeye Pipe Line Co. line 1.12

TIDE WATER ASSOCIATED OIL CO. and NEW YORK TRANSIT CO.
(Effective January 27, 1941)

Bradford, Pa. $2.30
Allegany, N. Y. 2.30

PENNZOIL CO.
(Effective January 27, 1941)

Group A $2.23
Group B 2.22
Group C 2.21
Group D 2.20
Group E 2.18

QUAKER STATE OIL REFINING CORP.
(Effective January 27, 1941)
Southern Ohio (Pa. Grade):
In Buckeye Pipe Line lines $1.85
In Eureka Pipe Line lines 1.89

PURE OIL CO.
(Effective January 27, 1941)
West Virginia $1.89

Canada

ONTARIO
(Nov. 6, 1939, by Imperial Oil, Ltd.)

Petrolia $2.10
Oil Springs 2.07
Bothwell 2.10

TURNER VALLEY
(Sept. 12, 1940, by Imperial Oil, Ltd.)
Crude-oil price schedule starts at $1.08, for 33°-33.9°, including 2 cents for each degree gravity with top price for 64° and over 1.70
These prices f.o.b. producers' field tankage.

Crude-Oil Price Change

Magnolia Petroleum Co. entered the Talco field, Hopkins County, Texas, as a crude purchaser at 7 a.m. March 1. The company posted a flat price of 65 cents per barrel.

A flat price of 70 cents per barrel was posted March 1 by the Texas Co. for Slaughter-Duggan field crude in Cochran and Hockley counties, West Texas. Limited sales from the field previously have been made on the general gravity table for West Texas ranging from 75 to 81 cents.

New York Markets

(Continued from Page 87)

reduction at Boston by the same supplier made the current quotation there $1.75.

Lubricating oils continued in good demand and Pennsylvania cylinder stocks are reported higher. The past week has witnessed the elimination of 8.5-cent quotations on 600 steam-refined stock and advances on the high side for both 650 steam-refined and 600-flash stock. The former is now quoted at 9 to 11 cents and the latter 9.5 to 12 cents, an increase of 1.5 cents for the 650 steam-refined stock high and 2 cents for the 600-flash stock. Stimulated domestic demand is accounting entirely for the improvement in the lubricating-oil market.

Wax quotations are also reported stronger in the New York market area. Quotations for crude-scale wax, both white and yellow, are reported at from 2.5 to 2.65 cents per pound with all material that had been offered at 2.35 cents apparently off the market. The improvement in the wax market is also laid entirely to domestic demand. Fully refined grades have not been affected by the improvement in crude-scale products, however, and prices range from 5.6 to 6.4 cents per pound, depending on the melting point.

Gulf Coast Markets

(Continued from Page 87)

and supplies are beginning to pile up.

No change was indicated in other products. Kerosenes continued weak and in absence of sales it was difficult to determine the actual market. There is not an excessive volume of material but quotations were as low as 3¼ cents.

Residual fuels were quoted at 72½ to 75 cents.

Mississippi Fields

(Continued from Page 83)

The company proposes moving from East Texas.

MISSISSIPPI COMPLETIONS

Tinsley—Yazoo County

Union Prod. Co. 6 Harris, NE NE 25-10-3, 202 bbl., ¼-in. choke, T.P. 150 lb., C.P. 220 lb., 7-in. casing perf. 4,966-90 ft., Woodruff sand, T.D. 5,015 ft.

STANDARD OIL CO. OF CALIFORNIA

Crude-oil prices at the well effective February 1, 1940

(All gravities above those quoted take highest price offered in that field)

Gravity—	Signal Hill (Long Beach) (El Segundo)	Wilmington	Seal Beach	Huntington Beach	Inglewood	Playa Del Rey	Olinda-Brea Canyon	Athens-Rosecrans	Torrance	Richfield	Whittier East Coyote (La Habra)	Montebello	West Coyote Hills	Santa Fe Springs	Greeley-Canal	Coles Levee Richfield Western	Mountain View	Elk Hills	Buena Vista, Midway-Sunset, Lakeview	Lost Hills	Coalinga	Kettleman Hills
14-14.9	$.65	$.60	$.64	$.63	$.64	$.65	$.61	...	$.65	$.61	$.61	$.62	$.63	...	...	...	...	$.60	$.60	$.60	$.60	...
15-15.9	.65	.60	.64	.63	.64	.65	.61	...	.65	.61	.61	.62	.63	...	...	...	...	.60	.60	.60	.60	...
16-16.9	.65	.60	.64	.63	.64	.65	.61	...	.65	.61	.61	.62	.63	...	...	...	...	.60	.60	.60	.60	...
17-17.9	.65	.62	.64	.63	.68	.65	.61	...	.65	.61	.61	.62	.63	...	...	...	...	.60	.60	.60	.60	...
18-18.9	.65	.64	.64	.63	.71	.65	.65	...	.68	.81	.61	.62	.63	...	...	...	...	.60	.60	.60	.60	...
19-19.9	.69	.69	.64	.67	.75	.70	.69	...	.72	.01	.65	.62	.63	...	...	...	$.60	.64	.64	.64	.61	...
20-20.9	.73	.73	.64	.72	.79	.76	.74	...	.75	.65	.69	.62	.67	...	...	...	.60	.69	.69	.69	.62	...
21-21.9	.78	.78	.64	.76	.82	.81	.78	...	.79	.69	.73	.62	.72	$.63	...	...	.64	.74	.74	.74	.66	...
22-22.9	.82	.82	.69	.81	.86	.86	.82	...	.82	.73	.77	.66	.76	.63	...	...	.68	.79	.79	.78	.70	...
23-23.9	.86	.86	.75	.85	.89	.92	.86	$.71	.86	.78	.82	.71	.81	.67	...	...	.71	.84	.84	.82	.74	...
24-24.9	.90	.90	.80	.90	.93	.97	.90	.77	.89	.82	.86	.75	.85	.72	...	...	.75	.89	.89	.86	.78	...
25-25.9	.95	.95	.86	.94	.96	1.02	.95	.82	.93	.86	.90	.80	.89	.77	...	...	.79	.94	.94	.90	.82	...
26-26.9	.99	.99	.91	.99	1.00	1.08	.99	.88	.96	.90	.94	.84	.94	.82	...	...	.83	.99	.99	.95	...	...
27-27.9	1.03	1.03	.97	1.03	1.04	...	1.03	.94	1.00	.94	.98	.89	.98	.87	$.83	$.92	.87	1.04	1.04	.99	...	...
28-28.9	1.07	1.07	1.02	1.07	1.07	f.o.b.	1.07	.99	1.03	.98	...	.93	1.02	.91	.86	.96	.91	1.09	1.09	1.03	...	...
29-29.9	1.10	1.10	1.07	1.11	1.10	our	1.10	1.04	1.06	1.02	...	.98	1.06	.96	.90	.99	.95	1.14	1.14	1.07	...	...
30-30.9	1.14	1.14	1.12	1.15	1.14	pipe	1.14	1.09	1.09	...	...	1.02	1.10	1.01	.94	1.02	.99	1.19	1.19	1.11	...	...
31-31.9	...	...	...	...	1.17	line	1.17	1.14	...	...	...	1.07	1.14	1.05	.98	1.06	1.02	1.24	1.24	...	...	...
32-32.9	...	...	...	...	1.20	...	1.20	1.19	...	...	...	1.11	1.18	1.09	1.02	1.09	1.06	1.29	1.29	...	...	...
33-33.9	...	...	...	...	...	...	...	1.24	...	...	...	1.15	1.22	1.14	1.06	1.13	1.10	1.34	1.34	...	...	$1.12
34-34.9	...	...	...	...	...	...	...	1.29	...	...	...	1.20	1.26	1.19	1.10	1.16	1.14	...	...	...	...	1.17
35-35.9	...	...	...	...	...	...	...	1.34	...	...	...	1.24	...	1.23	1.14	1.20	...	...	...	...	...	1.21
36-36.9	...	...	...	...	...	...	...	1.39	...	...	...	1.28	...	1.27	1.18	1.23	...	...	...	...	...	1.25
37-37.9	...	...	...	...	...	...	...	1.44	...	...	...	1.33	...	1.31	1.22	1.26	...	...	...	...	...	1.29
38-38.9	...	...	...	...	...	...	...	1.49	...	...	...	1.37	...	1.36	1.25	1.30	...	...	...	...	...	1.33
39-39.9	...	...	...	...	...	...	...	1.54	...	...	...	1.42	...	...	1.29	1.34	...	...	...	...	...	1.38
40-40.9	...	...	...	...	...	...	...	1.59	...	...	...	1.46	...	...	1.33	1.37	...	...	...	...	...	...
41-41.9	...	...	...	...	...	...	...	...	...	...	...	1.50	...	...	1.37	1.40	...	...	...	...	...	...
42-42.9	...	...	...	...	...	...	...	...	...	...	...	1.54	...	...	1.41	1.44	...	...	...	...	...	...
43-43.9	...	...	...	...	...	...	...	...	...	...	...	1.59	...	...	1.45	1.47	...	...	...	...	...	...
44-44.9	...	...	...	...	...	...	...	...	...	...	...	1.63	...	...	1.49	1.51	...	...	...	...	...	...
45-45.9	...	...	...	...	...	...	...	...	...	...	...	1.67	...	...	1.53	1.54	...	...	...	...	...	...
46-46.9	...	...	...	...	...	...	...	...	...	...	...	1.71	...	...	1.57	1.57	...	...	...	...	...	...
47-47.9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1.61	...	...	...	...	...	...	...
48-48.9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1.64	...	...	...	...	...	...	...

For Newhall, McKittrick, Kern River, Round Mountain, and Kern Front crude, Standard posts 60 cents per barrel for all grades. For Elwood Terrace crude (free on board ship), 33-33.9, $1.21, with 4 cents added for each degree up to and including 37° and over at $1.37; Wheeler Ridge crude, 19° to 21.9°, 60 cents; 22-22.9 63 cents; 23-23.9, 67 cents; 24-24.9, 71 cents; 25° and over, 75 cents. On May 18 Union Oil Co. adopted Standard of California prices in all fields in which they both purchase.

MARKET RECORD OF ACTIVE OIL STOCKS . . .

Compiled by Carl H. Pforzheimer & Co., 25 Broad Street, New York City, Member New York Stock Exchange and New York Curb Exchange

New York Stock Exchange

1941 High	1941 Low	Week ended Mar. 1 High	Week ended Mar. 1 Low	Week ended Mar. 1 Close	Stocks—	Total shares outstanding	Par value	Latest dividend	Payable or last paid	Dividends paid in 1940	Com. sh. earn. 1939	Com. sh. earn. 1938	1940 High	1940 Low	1939 High	1939 Low
50⅜	44	45¾	45½	45⅝	Amerada Corp.	788,675	N.P.	50cQ	1-31-41	$2.00	$1.56	$2.07	58½	38½	74½	50
24¼	20¾	21½	21⅛	21¼	Atlantic Refining	2,663,999	$25	25cQ	3-15-41	1.00	1.66	1.40	27⅛	18¼	24¾	18⅛
10½	8	8⅞	8¼	8⅞	Barber Asphalt Co.	390,223	$10	25c	5-21-40	.50	1.39	—.85	16⅝	8½	21	10¼
9⅝	7⅝	8½	7⅝	8⅜	Barnsdall Oil Co.	2,558,779	$5	15c	3-10-41	.60	.76	1.26	13⅜	7⅛	19½	11⅛
6	5⅜	5½	5⅜	5⅜	Consolidated Oil Corp.	13,751,726	N.P.	12½cQ	2-15-41	.72½	.55	.55	8⅛	5½	9⅞	6½
20¼	17⅜	18	17⅜	17½	Continental Oil of Delaware	4,682,572	$5	25cQ	12-23-40	1.00	1.35	1.10	25	16⅛	31½	19⅞
4½	3½	3⅞	3¾	3⅞	Houston Oil	1,098,618	$25	....	10-17-30	....	.43	.83	6⅞	3⅜	9⅜	4½
11⅜	9¾	10	9⅞	9⅞	Lion Oil Refining	435,815	N.P.	25cQ	12-31-40	1.00	1.50	2.09	14⅜	9	18⅛	10
15⅛	13⅜	14¼	13⅜	13⅜	Mid-Continent Petroleum	1,857,912	$10	40c	12-2-40	.80	1.42	.56	17⅝	11½	18	11⅛
11	9⅛	9½	9⅛	9½	Mission Corporation	1,378,645	$10	25c	12-20-40	.25	.87	1.04	11¾	7⅛	14⅞	8¾
6⅝	4⅞	5½	5¼	5¼	National Supply	1,155,517	$10	.	12-22-37	....	—.87	—.79	9¾	4⅝	15½	5⅝
7⅞	6¾	7⅛	6⅞	7	Ohio Oil Co.	6,563,377	N.P.	25c	12-14-40	....	—.10	.25	8¾	5⅜	10½	6
7⅛	5½	5¾	5½	5⅜	Pacific Western Oil	1,000,000	N.P.	40c	12-19-39	....	.81	1.22	8⅞	5½	11⅞	7
8½	7¼	8	8	8	Pan American Pet. Trans.	4,702,945	$5	25c	12-21-40	.25	1.10	.08	10½	6¾	8¾	5
41¼	35¾	36½	35¾	36	Phillips Petroleum	4,449,052	N.P.	50cQ	3-1-41	2.00	2.21	2.03	41¾	27⅛	46½	31¼
16⅞	14⅝	14¾	14⅝	14⅝	Plymouth Oil Co.	1,038,633	$5	25c‡	12-23-40	‡1.30	2.38	2.59	22¾	15	24	17⅛
8⅞	7	7⅜	7¼	7⅜	Pure Oil Co.	3,982,031	N.P.	25c	12-20-40	.25	1.11	.38	11½	6¾	11¾	6⅛
9	7¼	8¾	8⅛	8¾	Richfield Oil Corp.	4,010,000	N.P.	50c	12-21-40	.50	.65	.51	9¼	5⅞	10¼	6⅝
15⅜	12⅝	13	12⅝	12⅝	Seaboard Oil of Delaware	1,244,383	N.P.	25cQ	3-15-41	1.00	1.40	1.52	20	11	24⅜	15½
12⅜	10⅛	11⅝	11¼	11¼	Shell Union Oil	13,070,625	N.P.	50c	12-20-40	.75	.77	.72	13⅛	7⅝	17¼	9⅞
22⅜	18⅞	..	..	..	Skelly Oil	995,349	$15	50c	12-20-40	1.25	1.99	2.27	23¼	12¼	29½	15½
9¼	8⅜	8⅝	8⅜	8½	Socony-Vacuum	31,206,071	$15	25cSA	3-15-41	.50	1.10	1.29	12½	7⅛	15⅛	10¼
20¾	18	18½	18⅛	18⅛	Standard Oil of California	13,003,953	N.P.	25cQ	3-15-41	1.00	1.38	2.22	26⅛	16¼	33⅝	24¼
27⅞	25⅝	26½	25¾	26¼	Standard Oil (Indiana)	15,272,020	$25	25c	3-15-41	1.50	2.23	1.82	29	20¾	30	22⅝
36½	33	34⅜	33¾	34⅜	Standard Oil of New Jersey	27,280,998	$25	75c†	12-16-40	1.75	3.26	2.86	46½	29⅞	53½	38
38	34¼	34½	34½	36½	Standard Oil of Ohio	753,740	$25	37½c	3-15-41	2.00	6.64	1.81	41¾	26¼	32¾	17
58¾	54	55	54	54	Sun Oil	2,434,863	N.P.	25cQ§	3-15-41	•1.00	2.74	1.07	65⅞	46¾	66	45¾
1¾	1⅜	1⅝	1⅜	1⅝	Superior Oil Corp.	1,388,979	$1	10c	12-28-40	.10	.04	.24	2½	1⅛	3⅝	1⅜
40¼	34½	36	35½	35⅞	Texas Corp.	10,876,139	$25	50cQ	4-1-41	2.00	3.02	2.13	47⅝	33	50¾	32½
3⅜	2⅞	3	3	3	Texas Gulf Producing Co.	888,147	N.P.	10c	12-14-40	.20	.69	.86	4¼	2½	5¾	3¼
6	5⅜	5⅝	5⅜	5½	Texas Pacific Coal & Oil	888,236	$10	10c	3-1-41	.40	1.00	1.16	8⅝	5⅜	11⅜	7
10⅜	9½	9⅝	9½	9½	Tide Water Associated	6,371,827	$10	15c	3-3-41	.70	1.05	1.28	12	8¾	14¼	9½
14½	12¾	13½	13	13⅛	Union Oil Co. of California	4,666,270	$25	25c	2-15-41	1.00	1.25	1.47	17½	12	19¾	15⅛
29¾	25⅝	27¾	27¼	27¾	Union Tank Car Co.	1,177,381	N.P.	50c	3-3-41	1.75	2.07	1.16	29⅞	22¾	24¼	20⅛
1⅞	1⅝	1⅝	1⅝	1⅝	Wilcox Oil & Gas	470,768	$5	10c	2-15-40	....	.77	.52	3⅝	1¾	4¼	2⅜

•Also 5 per cent in stock. †Includes extras. ‡Also 2 per cent in stock. §Also 6 per cent in stock. —Deficit.

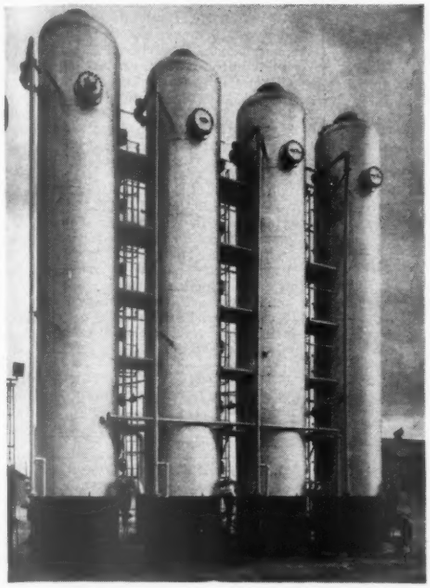
New York Curb Exchange

1941 High	1941 Low	Week ended Mar. 1 High	Week ended Mar. 1 Low	Week ended Mar. 1 Close	Stocks—	Total shares outstanding	Par value	Latest dividend	Payable or last paid	Dividends paid in 1940	Com. sh. earn. 1939	Com. sh. earn. 1938	1940 High	1940 Low	1939 High	1939 Low
7	5⅛	5⅞	5⅞	5⅞	American Republics Corp.	1,308,049	$10	25c	12-18-40	....	$0.14	—$0.22	10¾	4½	11¾	5½
1¾	1¼	1⅜	1¼	1⅜	Bridgeport Machine Co.	263,700	N.P.	$1.25	12-30-37	....	—.95	—.14	3¼	1⅜	7¼	2½
40¼	38	..	..	..	Buckeye Pipe Line Co.	200,000	$50	$1	3-15-41	$4.00	3.13	2.36	43	28	34⅜	26½
110¼	105	105	105	105	Chesebrough Mfg. Co.	120,000	$25	$1.50Q†	3-31-41	6.00	7.87	5.32	117	95	130	108⅝
5⅛	3¾	5	4¼	5	Cities Service (new)	3,703,978	$10	....	6-1-32	....	.68	.23	6¾	4	9¼	4¼
⅞	⅝	¾	⅝	⅝	Cosden Petroleum	465,332	$1	....	.....	....	....	....	2⅛	⅝	2¼	½
15¼	12¾	13⅛	12¾	12¾	Creole Petroleum	6,974,356	$5	50cSA†	12-16-40	1.00	1.38	1.64	24¼	11⅝	28	16¾
4¼	3¾	4	3¾	4	Darby Petroleum	351,390	$5	25cSA	1-15-39	....	.03	.69	4⅜	2⅞	7⅛	3⅝
1⅛	1	..	..	..	Derby Oil & Refining	263,162	N.P.	....	.....	....	—.37	—.91	2	⅝	2⅝	1½
28⅜	21½	..	..	..	Eureka Pipe Line	50,000	$50	$3.50†	2-1-41	2.25	.63	—.37	31	20¼	23	15⅛
33½	31	32¼	31	31⅛	Gulf Oil Corp.	9,076,202	$25	25cQ	12-27-40	1.25	1.69	1.43	39⅞	25⅛	45⅛	29¼
63	53¼	54	53¼	53½	Humble Oil & Refining	8,987,840	N.P.	37½c	4-1-41	2.00	3.33	3.98	68	47⅛	71	52½
6⅞	5¾	6½	6¼	6½	Imperial Oil of Canada	26,965,078	N.P.	25c	12-2-40	.62½	.71	.96	12⅝	5⅝	17	11⅜
3⅞	3⅛	3½	3⅛	3⅛	Indiana Pipe Line	300,000	$7.50	20c	11-15-40	•2.80	.33	.47	7⅝	3	7⅛	5½
10⅜	8⅞	9⅝	9½	9½	International Petroleum	14,324,088	N.P.	30c	12-21-40	1.25	1.19	1.98	10⅜	8¼	27½	17
2⅝	1¾	2½	2⅜	2⅜	Kirby Petroleum Co.	500,000	$1	10c	4-15-38	....	.06	.14	2¾	1⅝	3¾	2⅛
10⅛	9⅜	9⅞	9⅝	9⅞	Lone Star Gas	5,518,347	N.P.	30c	12-21-40	.70	.98	.88	10¾	7⅝	10½	7⅛
4⅝	4⅛	4⅜	4⅛	4⅛	Louisiana Land & Exp.	2,966,762	$1	10c	3-15-41	.35	.22	.45	6¼	3¾	7¾	4
10	9½	..	..	..	Margay Oil Corp.	149,943	N.P.	25cQ	1-10-41	1.00	1.52	2.28	17	9¼	17	14½
8	7	7¼	7	7	Midwest Oil Co.	998,474	$10	45c	12-16-40	.90	.99	.93	8½	6½	8¾	6⅝
5¾	5⅛	5¼	5⅛	5¼	Mountain Producers	1,593,584	$10	30cSA	12-16-40	.60	.70	.62	6¼	4⅞	6	4⅞
12⅝	11	12	11¾	11⅞	National Fuel Gas	3,810,183	N.P.	25cQ	1-15-31	1.00	.95	.84	13⅛	10	14	11¼
12¾	10¼	..	..	..	National Transit	509,000	$12.50	50c	12-16-40	1.00	.91	.88	12½	8¾	9½	7¼
1⅛	1	1	1	1	New Mexico and Arizona	1,000,000	$1	1c	12-1-37	....	.02	.02	1¼	¾	1⅜	1
7¼	6⅝	7	7	7	New York Transit	100,000	$5	25c	9-20-40	.60	.88	.16	7¾	5¼	6	4
9¾	8¼	..	..	..	Northern Pipe Line	120,000	$10	40c	12-2-40	.80	.31	.24	9⅞	6	7	4½
3⅜	2⅝	3⅜	2⅞	3¼	Pantepec Oil	2,856,872	$1	....	.....	....	....	....	5½	2½	7⅝	4
1½	1	..	..	..	Root Petroleum Co.	336,045	$1	25c	2-1-37	....	.70	.17	3¼	1	5	1¼
2½	2⅛	2⅛	2⅛	2⅛	Ryan Consolidated	298,931	N.P.	10c	12-28-40	....	.16	.29	3	1½	3	1⅞
8	7	..	..	..	Southern Pipe Line	100,000	$10	25c	3-3-41	.50	.25	—.27	11¾	4¾	4⅞	3½
39¾	37¼	37¼	37¼	37¼	South Penn Oil	1,000,000	$25	$1.87½†	12-20-40	2.50	2.84	1.44	44	28	40½	26¾
30½	24½	..	..	..	Southwest Penna. Pipe Lines	35,000	$50	50c	12-26-40	6.50	2.06	—.41	35	21	23	18
20⅜	18	18½	18⅛	18½	Standard Oil of Kentucky	2,604,790	$10	25c	3-15-41	1.30	1.53	1.45	20⅞	16½	20⅛	17¼
1¾	1⅜	1¾	1⅜	1⅝	Sunray Oil	1,975,876	$1	5c	12-20-40	.10	.25	.23	2	1⅜	2¾	1¾
3	2¾	3	..	..	Texon Oil & Land	936,024	$2	10c	12-30-40	.40	.49	.56	3⅛	2	4	2⅝
2½	2¼	2½	2½	2½	Transwestern Oil Co.	750,000	$10	....	.....	....	—1.42	.12	3⅜	2	6	2½
⅞	⅝	¾	11/16	¾	United Gas Corp.	7,818,959	$1	....	.....	....	—.55	—.51	2⅛	¾	3⅜	1⅛

•Includes $2.50 capital distribution. †Includes extras. —Deficit.

EQUIPMENT PROGRESS...

GASOLINE-PLANT ABSORBERS



The absorbers pictured above were fabricated and erected by Wyatt Metal & Boiler Works for Shamrock Oil & Gas Co., Sunray, Tex., for gasoline-plant operation. These towers are 48 in. by 60 ft. and are 1,500 lb. working pressure.

BUSINESS NOTES

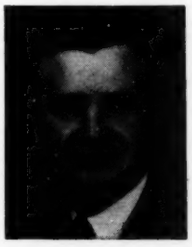
Martin-Decker Corp., Long Beach, Calif., has announced changes in the territories covered by two of its Mid-Continent factory men. Jack Clemens, located at Corpus Christi, Tex., will henceforth include Houston and vicinity in his territory. Dave Waters, formerly working out of Houston, will cover North Texas and the states of Oklahoma, Kansas, and Illinois for the company. Both men will install and service all types of Martin-Decker weight indicators, gages, and recorders on wells in their respective districts.

Ethyl Gasoline Corp. has changed its Tulsa division offices from its testing laboratory at 305 South Kenosha to 525 National Bank of Tulsa Building.

The Reed Roller Bit Co., Houston, Tex., has opened an office at 615 National Bank of Tulsa Building, Tulsa. Fred Tyler is in charge.

John Van Nort to Represent Duff-Norton in Chicago

The Duff-Norton Manufacturing Co. of Pittsburgh, Pa., has recently appointed John F. Van Nort as sales manager of its western division. His headquarters will be at the company offices, Peoples Gas Building, Chicago, with Alex S. Anderson, district manager.



JOHN F. VAN NORT

Mr. Van Nort has been associated with a United States Steel Corp. subsidiary for 17 years, serving in various sales capacities in the eastern territory. He comes to Chicago direct from the Duff-Norton plant in Pittsburgh, where his duties in various departments have given him a thorough knowledge of the application and operation of lifting jacks, as well as familiarity with the mechanical details of the Duff-Norton line.

New General Manager of Sales for Roebling

Ernest C. Low has been appointed general manager of sales of the John A. Roebling's Sons Co. Mr. Low has been identified with the Roebling organization for 32 years. Upon graduation from college in 1909 Mr. Low joined the California division of the company at Los Angeles, serving in various sales capacities.

Mr. Low was appointed manager of the San Francisco branch in May 1930, and on January 1, 1940, was elected president and general manager of the John A. Roebling's Sons Co. of California. Mr. Low assumed his duties March 1 with headquarters at Trenton, N. J.

Longer-Wearing Valve Stems

The Hancock Valve Division of Manning, Maxwell & Moore, Inc., Bridgeport, Conn., announces a new, longer-wearing alloy, Hancodur, for valve stems and bonnets. This self-lubricating alloy was developed expressly for use in Hancock superfinished "500 Brinell" bronze valves. It is claimed by the makers that repeated breakdown tests indicate that these new Hancodur valve stems and bonnets outwear other stems and bonnets six times.

It is stated that Hancodur stems have a tensile strength of 90,000 lb. per in. plus a high self-lubricating characteristic that resists galling and wear. The makers say that due to increased production and lower manufacturing costs—their full line of Hancock superfinished "500 Brinell" bronze valves are now furnished with Hancodur stems and bonnets at no increase in price. An interesting bulletin giving complete details may be had for the asking.

LOS ANGELES NOMADS HOLD SECOND ANNUAL INAUGURAL DANCE

The second annual inaugural dinner dance of the Los Angeles chapter of Nomads, in honor of its new and retiring officers, was held at the Wilshire Country Club at Los Angeles, Calif., on the evening of February 14. This year's party was highly successful, there being about 275 present, including foreign visitors as well as oil-company and equipment men. Members of the Los Angeles chapter who attended the dinner dance are shown in the accompanying photograph.

The new officers of the Nomads are: E. B. Fowks, Emsco Derrick & Equipment Co., president; W. F. Bettis, M. O. Johnston Oil Field Service Corp., vice president; Earl M. Rees, Oil Well Manufacturing Co., secretary-treasurer; Elmer R. Smith, Lane-Wells Co., assistant secretary-treasurer; R. J. Eiche, sergeant-at-arms; and Roy Hitchcock H. & B. Sales Co., deputy sergeant-at-arms. Regents elected to the national organization are: T. Sutter, Baker Oil Tools, Inc., and W. F. Bettis.

The retiring officers are: T. Sutter, president; S. R. Bowen, S. R. Bowen Co., vice president; W. F. Bettis, secretary-treasurer; E. M. Rees, assistant secretary-treasurer; E. B. Fowks, sergeant-at-arms; and S. R. Robinson, Yowell Service Co., deputy sergeant-at-arms.

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LEASES—East Texas, La., South Ark. 20 acres up, dollar acre up.—Owners—Address Attorney. Box 1122, Little Rock, Ark.

EAST TEXAS Woodbine-Trinity sand wildcats starting. Leases afford 10 to 50 for 1 bet. Has already happened past 60 days. E. CROFT, PROCTOR, TEXAS.

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Another block in a NEW HOT SPOT. This is a good bet. Buy direct and save those dollars. No middle man to pay; no salesmen to bother you. Better buy a little of something, than a whole lot of nothing.

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FOR SALE Oil and gas leases and small production located in Kentucky shallow field, also tracts of proven Fluorspar and zinc deposits. Reports on request. W. P. HARLEY, Bowling Green, Kentucky.

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GET AHEAD of the big play with this new 10 year, 34 acre lease, directly between the big Joaquin field and the Shelbyville wells, $5 per acre. Map furnished on request. C. A. Parker, Box 451, Center, Texas.

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130 ACRES raw timbered land. Southeast Okla. $350.00 with all mineral rights. 2026½ W. 37th Pl., Tulsa, Okla.

Leases and Drilling Blocks

HOMER L. FITCH, GEOPHYSICIST AND LOCATION ENGINEER
WHY drill dry holes? Our method only locates structures which contain oil or gas. Drawer 711, Brownsville, Texas.

FOR SALE, 160 acre lease off-setting 20 year production. Eastern Kansas. Bartlesville Sand 800 feet deep. Pipe line market. No pro-ration, sell all you produce. Will sell lease or assign with well completed. Also have some leases ideal for water flooding. 600 acres proven gas with .25 ct. market. Write stating type project interested in. H. B. Snyder, Box 126, Ottawa, Kansas.

1,000 TO 5,000 ACRE leases, Clinton County, Ky., close to new production. 50c to $1 if taken immediately. John A. Damron, Albany, Kentucky.

WILL lease Section 8, Block C-20 and half Section 140, Block 13, Reeves County, $2.00 per acre, 10 years, 25c annual rental. Vicinities largely leased by majors. Good investments or divide and resell. E. L. Stratton, Pecos, Texas.

OWN shallow, deep production, West Texas. Also wildcat block. Need help to develop.
500 Taylor, Fort Worth, Tex.
2-8486.

NO DRY HOLE RISK
Five pay strata possible, deepest 1400 feet. Field structurally high and new pool probable. Will assign full seven-eighths working interest 240 acres if you drill one well on it. Snap this, it's good.

H. B. BUDDENBORG
Carlinville, Ill.

I BELIEVE that I have the best prospective Oil producing leases in Greenwood-Elk Co., Kans. Depth 1250, Kans. City Lime production. 300-500 bbl. wells possible. Liberal Deal. C. H. RESER, 3315 Victor, Wichita, Kans.

Incorporations

DELAWARE CHARTERS: Complete service $35. Submitted forms. Chas. G. Guyer, Inc., Wilmington, Delaware.

CAPITAL SEEKERS
Put your project before 260 Key-Men. Cost trifling. Details free. AMSTER LEONARD. Fox Theater Building, Detroit, Michigan.

Royalties

ANDREW J. BARRETT
The Philtower
Tulsa, Oklahoma

Brokers—Salesmen

Sell in the most active area in the United States—The Permian Basin of West Texas and Southeastern New Mexico. From the standpoint of royalty investors this area has much to offer. Can supply you with choice non-producing royalties located on geophysical highs. Also drilling blocks, close in acreage to production, or wildcat leases. I maintain my own field men who cover this area for me. All offerings meet the requirements of the Security and Exchange Commission. Inquiries invited.

B. D. BUCKLEY
Paul Brown Bldg., St. Louis, Mo.

WE MAINTAIN A MARKET FOR REGISTERED DEALERS IN ALL FORMS OF OIL INVESTMENTS
FIRST DEPENDABLE OIL CORP.
522 Fifth Ave., New York, N. Y.

FOR SALE: Royalty in proven Okla. field, 50 producing wells in Co. Write Box 524, Manitou Springs, Colo.

Oil Industry Printing

OIL FIELD LEGAL BLANKS
Leases, assignments, releases, township plat books, well records, etc. Request on your letterhead gets free catalog. Olds Press, 215 East Third St., Tulsa, Okla.

Geologic Survey

GEOLOGISTS—SURVEYORS
Looking for U. S. or State Geologic Surveys, or other government publications? Write Cornwall's Book Store, 723 Eleventh Street, Northwest, Washington, D. C. Unusually large stock.

Situations Wanted

OIL Equipment Salesman, with proven sales ability and well acquainted with refiners and producers on Gulf Coast, seeks connection. Draft Exempt. Excellent References. Box A-370, The Oil and Gas Journal, Tulsa, Okla.

ENGINEER Construction—12 years' experience refinery, gasoline plant, pipe line construction. Returned February 1st from construction job South America. Qualified refinery operation. Desirous making connection in construction, operation or in sales of equipment or machinery in the U. S. or South American territory. Age 35 years. College. Write or wire Box A-374, The Oil and Gas Journal, Tulsa, Okla.

LAND, LEASE, TITLE-MAN: 10 years' experience in Oklahoma, Kansas, Illinois. Past 2 years in Illinois with large major company. Presently employed, desire change. Experienced in lease and royalty buying, pipe-line work, damage settlements. Expert title-man and typist. Age 37. Married. Can furnish car. Best references. Box A-382, The Oil and Gas Journal, Tulsa, Okla.

CHEMICAL ENGINEER, 11 years experience in petroleum refinery equipment design and process development. Now employed. Box A-383, The Oil and Gas Journal, Tulsa, Okla.

EXPERIENCED equipment salesman in both oil and industrial trade, seeks connection to travel Mid-Continent. Good references. Draft exempt. Mr. Buck, Box 3089, Houston, Texas.

CHEM. Eng. 10 yrs. experience in Refining of Lube Oils, Waxes, etc. Supervisor & Process Eng. Add. Box A-330, The Oil and Gas Journal, Tulsa, Okla.

Help Wanted

WELDING Engineer, graduate metallurgist with experience in fabrication procedure and welding practice. State acceptable salary. Battelle Memorial Institute, Columbus, Ohio.

AMERICAN CITIZENS, wanted three draftsmen, not now engaged in National Defense work, familiar with power plant design and modern piping. Give complete experience record and sample of work. Address: SIEMS DRAKE, Puget Sound, Seattle, Washington.

LOCOMOTIVE (used) SALESMAN. Acquainted more with Steel Plants and other Industries than Railroads although latter acquaintance naturally that much more desirable. Railway Car experience, similarly. Fixed, so extensive traveling and home absence positively no handicap because entire country his field or market. Drawing account and participation. Obviously, exceptional opportunity for man having positive confidence in his own ability. Others should not waste their time applying because we capable judging all applicants' abilities. Replies inviolably confidential. State entire history and advance necessary. Temperate habits prime requisite. Gentile company. Box A-390, The Oil and Gas Journal, Tulsa, Okla.

Ranches—Farm Lands

7,310 ACRE ranch $10.50 per acre, 17 miles west Seagraves, Texas, on hard surfaced road, fenced, abundance water. 200 acres cultivation, could be cut into farms, as 7,000 acres would make good farm land. Part of mineral rights reserved. Two producing oil wells recently completed on land, 841 bbl. and 967 bbl., respectively. Three-fourths of mineral rights under the two producing oil wells goes with land. Terms $65,000.00 Cash. Balance low rate interest. The land less the oil income is an attractive buy. No trades. Brokers do not answer, as no commissions will be paid. Lee R. Slater, R. F. D. #1, Plains, Texas.

FOR SALE: 480 A. Colo. ranch. Good house, springs, 3 mi. booming twn. 4 mi. $15,000,000 reservoir now building. Wt. title. $4,800. Address Owner, c/o Crit Allen, Lamar, Colo.

CLASSIFIED ADVERTISING RATES

Classified advertising rates: First insertion, 35 cents a line; each additional insertion, 25 cents a line, PAYABLE IN ADVANCE. Six words usually make a line. Count as a word each one-letter word and each group of figures. White-space computed at regular line rate. Allow two extra lines for blind ads. Ads of less than three lines not accepted. No formal acknowledgment is made, and proofs cannot be shown in advance of publication.

	1 time	2 times	3 times	4 times		1 time	2 times	3 times	4 times
3 Lines	$1.05	$1.80	$2.55	$3.30	7 Lines	$2.45	$4.20	$5.95	$7.70
4 Lines	1.40	2.40	3.40	4.40	8 Lines	2.80	4.80	6.80	8.80
5 Lines	1.75	3.00	4.25	5.50	9 Lines	3.15	5.40	7.65	9.90
6 Lines	2.10	3.60	5.10	6.60	10 Lines	3.50	6.00	8.50	11.00

CLASSIFIED DISPLAY RATES

Classified Display is set with a border and may be used in one or two column sizes.

1 Inch	1 time	$5.00
1 Inch	13 times	4.50 per inch
1 Inch	26 times	4.00 per inch
1 Inch	52 times	3.50 per inch

This space may be contracted for over a period of one year from the date of the first insertion and is PAYABLE IN ADVANCE, MONTHLY.

We reserve the right to withhold all advertising of questionable character. To avoid delay be sure to send remittance with copy. We will set your ad in the smallest amount of space possible and refund all overpayments. One-time insertions will not be run until fully paid. Forms close MONDAY NOON before each issue date.

THE OIL AND GAS JOURNAL
Tulsa, Oklahoma